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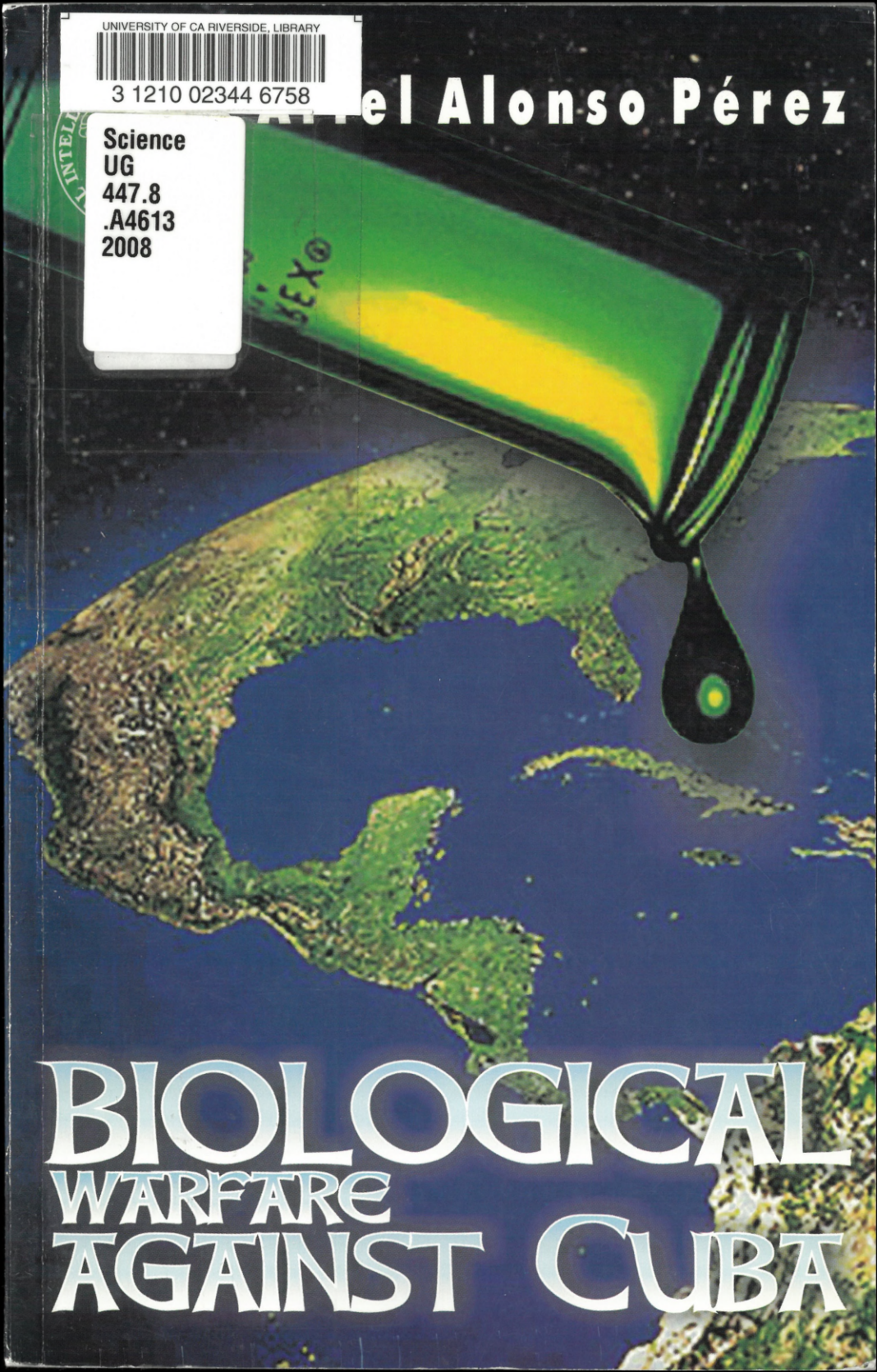

BIOLOGICAL WARFARE AGAINST CUBA

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Ariel Alonso Pérez

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"Science without conscience is but ruin of the soul."

FRANÇOIS RABELAIS

To Magaly,
She is in every letter of this book.

To Commander of the Revolution Ramiro Valdés Menéndez, a combatant in the Moncada, an expeditionary on the Granma, a commander in the Sierra and Che's deputy during the invasion; a minister of the Interior, a founder of the State Security and a historical leader of our Revolution.

To Lieutenant Colonel Dr. Gustavo Blanco Oropesa, my boss and friend. He taught me that bioterrorism was not science fiction and provided me with the knowledge to fight the enemy and neutralize one of its most sophisticated weapons, a "science" created for killing: biological weapons.

ARIEL

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Index

Foreword / 13

Death looms ahead / 17

Biological warfare and bioterrorism / 20

What are biowarfare and bioterrorism? / 30

The United States of America, biowarfare and bioterrorism / 42

The CIA spy work on Cuba: in search of information for bioterrorism / 52

Cuba targeted by the bioterrorists. Proven and unproven cases of bioterrorism on Cuba; admission by the United States / 58

Hemorrhagic dengue / 68

The Thrips palmi karay: a new aggression, a proven hypothesis / 113

A "tamed" fauna / 121

Annexes y Tables / 127

Bibliography / 155

Foreword

"Science without conscience is but ruin of the soul." This stunning assertion by Francois Rabelais in the 16th century, serves as a useful preamble to the recent statement by the academies of sciences of the world on biosafety.

Such statement reaffirms and endorses the provisions of the 1972 International Biological and Toxin Weapons Convention, in the sense that: "...every state signatory to this Convention will never, under any circumstances, develop, produce, stockpile or in any form purchase or keep any kind of microbial or biological agents, or toxins, regardless of their origin or production method, of the kind and quantities which cannot be justified as intended for prophylaxis or other peaceful purposes." As far as the signatory academies are concerned, their scientists are under obligation not to cause any harm.

This ethical imperative could be considered the underlying subject of Ariel Alonso Perez's work. The subject has been systematically concealed or silenced. The same has happened with the actions undertaken as part of the destabilization policy pursued against the Cuban revolution by several U.S. administrations. They have covertly or overtly trampled on every rule of civility or humanity.

Alonso is not a scientist by training from whom one would expect brainy explanations, detailed descriptions or complex chains of arguments. He is, however, a determined fighter and an exhaustive researcher and collector of startling evidence. These include those scientific and technical by nature, which prove the utilization of

scientific knowledge against the Cuban people and its resources by the Intelligence Agencies of the mightiest imperialist power.

The reader should be aware that when "science is geared for death", as it has been geared against our country, it does not necessarily involve the creation or utilization of selectively toxic organisms o particularly deadly substances.

There is another way, more subtle and less evident but no less efficient and evil, involving the use of well known organisms, "standard" elements of the natural or farming ecosystems, as well as human pathogens well established by biology, which under well studied conditions can have considerably harmful effects.

The deadly science, the "ruin of the soul", is thus expressed through the deliberate manipulation of strains, varieties, environmental conditions, the presence or absence of predators, antagonists, etc. with the evil purpose of bringing harm to people, animals and crops. To cap it all, the executioners try to succeed while avoiding accountability. Therefore, the design of the aggression will be specially aimed at bewildering as much as possible the unaware observer and the public at large in order to spare the real culprits and, whenever possible, to blame the victims themselves.

It is significant that from the political viewpoint, the work offers a thorough review and compilation of proofs and testimonies from American sources. The hearings held by the U.S. Senate and some agencies associated with the U.S. Congress are particularly striking as they concede the use of elements of biological warfare against Cuba.

Equally significant are the testimonies of former CIA agents and officers, and of well-known counterrevolutionary ringleaders, who openly admit to having intentionally caused the 1981 hemorrhagic dengue fever epidemic, and to introducing the African swine fever a few years back.

This work offers the reader a historically valuable material clearly establishing the conditions, methods and circumstances in which the main actions of the biological warfare were instigated or carried out by or with the complicity of the U.S. administrations bent on a dull crusade aimed at submitting the Cuban people through hardships, disease and death, in order to put an end to the historical cycle that began on January 1st, 1959.

That feature alone would suffice to hail the publication of this book and to recommend it. But this book, perhaps as a reflection of the personality and life of its author, is also a major instrument to denounce and to struggle; an ideological weapon in the hands of the Cuban revolution in its historic confrontation with contemporary American imperialism, in the area of scientific materials and procedure.

I am confident that its clear language and the sequential presentation of the events will meet the expectations of both the readers acquainted with scientific subjects and those rather interested in the epic events narrated here. It will be up to the readers to ultimately validate this work.

Dr. Ismael Clark Arxer
President of the Academy of Sciences of Cuba

Havana, April 2007

Death looms ahead

It was the year 1981, in the month of April, when Cuba commemorates significant developments. On the 4th, it's the foundation of the José Martí Children's Organization and the Young Communist League, which bring together Cuban schoolchildren and youth, respectively. On the 15th, the people remember how in 1961 the city of Havana became the target of an attack and the airports at San Antonio de los Baños, Ciudad Libertad and Santiago de Cuba were bombed. This was only the prelude to the mercenary invasion that took a toll in human lives, mostly among the youth. That day, one those young men, Eduardo García Delgado, in the last seconds of his short life, and with his own blood wrote the name of Fidel on a piece of wood.

The following day, April 16, the people commemorate the proclamation in 1961 of the Cuban Revolution's decision to build Socialism. One day later the mercenary invasion materialized by Playa Girón at the Bay of Pigs.

It was precisely in this context of memories and joyfulness that, —as it did every month of April, amidst the beauty of the spring season that fills the gardens with its multicolored flowers— the Cuban people went about their daily lives working towards a better future.

Meanwhile, in the outskirts of the city, in the municipality of Boyeros, people went to work as usual. The public transportation carries numerous people to that industrial zone where the José Martí International Airport sits.

However, there was more than joy and celebration. For almost two years an epidemic of meningococcal meningitis had taken the lives of over 200 Cuban children. The country's scientists worked hard trying to find a definitive solution. Meanwhile, the population endured the discomforts of the influenza virus which circulates in Cuba rather often, the same as in any other country in the world.

Still, there was something out of the ordinary. The highly trained Cuban pediatricians from that municipality were finding in some children certain symptoms which did not match the abovementioned illnesses. So, there was a growing concern.

Some hospitals, particularly the pediatric hospitals in the municipality, had been reporting hemorrhagic symptoms associated to abnormal bleeding into the skin and to unusual mechanisms of blood clotting, pinpointed red spots (petechiae)[1], bleeding in the lungs and a state of shock.

On April 7, in the community of Baluarte of the same municipality, the death of the child Alberto Alexis Jiménez would be the first associated to this phenomenon. The little boy, a student in the local elementary school, fell ill and his condition deteriorated so quickly that he died on arriving at the hospital. According to later investigations, he had been infected at school.

Only a few days later, on the 19th of the same month, the neighbors of the community were hit by the particularly sensitive death of an infant, this time it was a girl: Misleidy Jiménez. This case was still more dramatic for it was a nine month old baby, and a cousin of the first deceased, who, like all children in the country had received free prenatal care and prophylactic treatment.

Other people would get sick and die from what has been characterized as the worst epidemic that ever battered the country, from the days when the Cuban outstanding doctor Carlos Juan Finlay fought the terrible yellow fever and —for the good of mankind— discovered the vector that transmitted the disease: a mosquito named Aedes aegypti.[2]

On June the same year another death, associated to the same epidemic, left forever its sad mark on another Cuban family. This month, at the Calixto Sanchez community, in the same municipality,

[1] Small red dots on the skin caused by internal blood effusion.
[2] A kind of tropical mosquito.

a Cuban worker —Iraido Ystocasu— couldn't show up at work in the morning; his wife was seriously ill. She was hospitalized and her condition worsened until her death on the 23rd. Addis Morales, that was her name, would never see her home again; her four little children would never see her again either.

After that, Iraido would become father and mother to his children that he has raised with much love and responsibility. But they would forever miss their mother's love, her hugs and kisses every morning before leaving for school. Now they live with that emptiness in their hearts and tears in their eyes, as every year on their mother's birthday or on Mothers' Day they go to the cemetery with their father to lay flowers at her tomb.

And all this happens because some murderers, terrorists trained and paid by the empire to the North, introduced in the country the virus causing the "mysterious" disease. Thus, Addis, and the children Alberto Alexis and Misleidys would join the list of 101 children and 57 adults who perished the victims of biological terrorism.

But, what disease was it? How could this epidemic spread in the country that has done the most for its people's health? Where did this terrible virus come from? Who are developing germs that can make people fall ill, and kill them ruthlessly and deliberately? When did this diabolic science to kill emerge? Who were the ideologues who founded this modality of terrorism commonly known as biological warfare?

The answers to these and other questions the readers will find in the following narrative. This is about one type of aggression the United States of America has used against Cuba and that had gone unpublished until now. Here the reader will learn how a large group of Cuban scientists and researchers have faced with passion and dedication such actions and tried to prevent greater damages to our economy and more human deaths.

Biological warfare and bioterrorism

The use of biological organisms as a combat weapon or in biological terrorism dates back to mankind's early days, from the very birth of medicine and following the moment that man for the first time spread a deadly substance on the point of an arrow.

Rather early, after the large social division of labor and the emergence of a class structure, history registers the use of toxic gases and contaminated animals to transmit diseases. There are many stories about the contamination of food, wine and water sources to bring death or illness on people and animals.

Many text books on early tribes and communities describe devices and witchcraft used to bring damage to the health of people and crops by contending groups. In our Americas, we find references to native tribes that prepared some kind of cylinder-shaped devices which they placed in the enemies' territory where they would adversely affect people's health.

The Bible, written in the first centuries of our era, already referred to how God launched eight pests against Egypt, among them, those of frogs, lice, flies; also pests affecting the cattle, the pest of ulcers and that of locusts. (Exodus, 8:1-15, 16:32, 9:1-12, and 10:1-20) They undoubtedly correspond with known biological means used in modern times for biological warfare and terrorism, which proves that regardless of contradictions and religious-mythical aspects, the authors of the biblical texts, at that early stage, were familiar with the idea that damage could be caused with those agents.

The Middle Ages and the conquest of the Americas register nefarious stories eloquently reflecting the power to transmit dis-

eases as epidemics which is the procedure followed in biological actions.

The conquest of Mexico in 1519 was marked by the high mortality of the original peoples. The Spanish conquerors brought with them and their animals a deadly biological weapon, that is, all kinds of microorganisms, new and unknown insects and vectors which caused what the natives called cocoliztli, matlazahuatl, tepitonzahuatl, hueyzahuatl and many other transmissible and infectious diseases. These decimated the population in the center of Mexico from approximately 25 millions in 1519[1] to one million in 1605.

The northeast of the United States of America and the southeast of Canada were not spared the biological crimes of the European conquest when in 1793 British officer J.A.Anhert deliberately introduced smallpox to exterminate the original populations of what was then known as Nova Scotia.

Perhaps the most violent epidemiological event that humanity can recall illustrating the magnitude of this phenomenon, took place in Medieval Europe, between 1346 and 1353. It was the scourge of the Black Death or bubonic pest.

The bubonic pest is an acute bacterial disease affecting the rodents and caused by the bacteria known as *Yersinia pestis*. It is transmitted from one rodent to another and from these to man after the bite of infected ectoparasites[2]. Although ticks and lice can transmit the *Yersenia pestis* to sensitive animals, the most significant carriers are the fleas. The epidemics of the Black Death usually start with infected rats, and the germ is transmitted to man by the *Xenopsylla cheopis*, the most common flea with the rats.

The first description of the disease refers to an outburst in an Egyptian port, in the year 542 A.C. The pandemic, which started in China, reached catastrophic proportions in the 14th century reaching Europe in 1347. It quickly extended to Africa, Greece, Italy, Spain, England and Central Europe. The deadly epidemic reduced the continental population from 100 million to 75, that is, by one fourth. The areas most affected by the Black Death were the cities of Florence, Venice, Paris, London and Avignon, which were the most important at the time.

[1] La Guerra bacteriológica, Manuel Servin-Massieu, revista Nexos, No.77, 1984.
[2] Parasites attacking the skin, such as, fleas, lice, tick, etc.

In the French-Indian War many Indians fell ill and died due to their contact with blankets and clothes previously used by smallpox patients.

Still, despite the previous examples showing the possibilities of using biological means and their effects, it was not until World War I that it became known that various countries had produced and used biological means in combat actions. Experiments are known to have been conducted with human beings by some nations, notably Germany and Japan.

In 1916 the Germans were accused of introducing in Bucarest cattle and horses previously inoculated with anthrax[3] and other illnesses. Similar events were reported in France in 1917.

That same year the withdrawing German army had left behind microbe cultures, which were found out by the French.

The German medical doctor, Colonel Winter, who at that early stage was already bent on imposing that kind of war, admitted in 1941 that on April 1916, while a rural doctor in the General Headquarters of the 21st Army Corps, he submitted to the Ministry of War a Memo on biowarfare, suggesting an attack on London and on the British ports with the most "efficient" and terrible weapon: the bacillus of the Black Death.

Also during the Manchurian War, the Japanese troops used bombs infected with anthrax and produced toxins from bacterial cultures. In 1922, an international commission made up by four outstanding bacteriologists considered that "the damages caused by bacteria are unlimited and that an aggression during a war could be equally dangerous for both parties."

From 1934 to 1945, Japanese imperialism launched several biological aggressions against China and the Soviet Union.

A hair-raising story, which for many years remained protected by the Freedom of Information Act of the United States of America, was revealed about the experiments and actions of the Japanese army in terms of biological war. Despite the U.S. administration's cover up, showing Washington's desire to guarantee exclusive control over the Japanese experience with biological weapons, the truth became known.

[3] Bacterial disease caused by the bacillus anthraxes, also known as bacterial carbuncus.

Once in possession of that secret, the United States delivered all the material contained in the files to Fort Detrick, one of the main research centers of the US army in this category.

By 1945, Japan already had one of the largest biological arsenals and great experience as well as a good amount of germs and vectors, and the necessary devices for spreading them. This experience was partly due to the diabolic experiments conducted on human beings —war prisoners— used as "guinea pigs". It has been estimated that around three thousand people died as a result of these experiments in the laboratories of the notorious Detachment 731, and in Unit 100 and the Tama Detachment, where similar experiences were carried out. Even Chinese women were infected with syphilis in order to test treatments on that disease.

The first information in this connection was revealed by witnesses who testified at the Khabarovsk trial, disclosing experiments underway since 1943. However, on July 15, 1947, Cecil F.Hubbert, member of the U.S. Coordinating Committee on the War and the Navy, recommended that this issue be kept secret.

Professor Ienaga Saboro in his book *The Pacific War* revisited this chapter of history, relating details of experiments with vivisection[4] at the Imperial University of Kyushu on U.S. pilots shot down in battle.

The biological warfare project started in 1931 when the Japanese troops occupied the northeast province of China and army surgeon Ishii Shiro persuaded his superiors that biological means could be a low-cost weapon causing the enemy many casualties. Then, he proceeded to build the indispensable facilities, to produce the necessary germs, ensure conditions for breeding insects and a prison for the human beings who would be used for the experiments. He also built a storage facility for the devices, a landing strip, the crematorium and an area for testing. All of this was destroyed by the Japanese themselves before the Soviet troops arrived in the area. The files in the archives, some means and the reports with the results of the experiments were taken from Japan.

In the official archives of the People's Republic of China there is a list of eleven cities that would be targeted for biological aggressions

[4] Vivisection: Detailed study by dissecting live animals or humans with the purpose of conducting physiological or pathological research.

with artificially disseminated epidemics, between 1940 and 1944, causing a high number of victims.

On October 27, 1940, the Chinese nationalists denounced that the bubonic pest had been dropped on the city of Ningho, near Shangai. The incident was not scientifically investigated; yet, some suspicious elements came to light. According to witnesses, something had been dropped by a Japanese aircraft. Later, there was a major infestation of fleas, and further still, it was reported that 99 people had fell ill from the bubonic pest. However, the city rats were not infected with the disease even when this type of epizooty[5] starts with the rat population.

Another development —this one was investigated— was reported on November 4, 1941, when a Japanese plane flew at low altitude in the morning over the city of Changde, in the Hunan province. Many found it amazing that instead of bombs the aircraft dropped wheat and rice grains, pieces of cotton and paper, which spread through the streets of the city. In the following three weeks, six people living in these streets died with the classic symptoms of the bubonic pest. The anatomic-pathological analysis of the bodies by Doctor Chen Wenkwei confirmed the lesions compatible with the bubonic pest. The diagnosis was corroborated after testing laboratory animals.

A few months later, on March 31, 1942, Doctor Robert K.S.Lim, director of the Red Cross in that country, and the internationally acclaimed epidemiologist R.Politzer, who was in China on a war time mission, confirmed Dr. Chen's findings.

Some time later, Japanese experts and technicians would also confirm Dr. Chen's findings. They indicated that the fleas, after feeding on the blood of rats infected with the pest, were wrapped in cotton and then in paper: the grains of wheat and rice were added to attract the rats so that these were bitten by the fleas and the disease was transmitted "naturally".

At the Khabarovsk trial on December 1949 evidence and documents were introduced showing the orders issued for the use of this type of biological weapon. Some documents related to the supplies sent for the biological war and the prisoners kept in the laborato-

[5] Epizooty: an illness affecting one or various species of animals due to one general and transitional cause. It's like an epidemic attacking humans.

ries, which confirmed the accusations made by the Chinese nationalists. Likewise, the Japanese witnesses and defendants corroborated it.

Another story about biological war occurred with mysterious Japanese balloons. These floated on the U.S. air space and fell on its territory during the war but the government decided to keep the secret for twelve years after the event.

The many experiments and reports on the work of the Japanese at the time regarding the use of biological war would be endless to enumerate in this book. On the other hand, our only intention is to offer some of the main examples with interesting data on this type of war throughout the history of mankind.

So, the United States of America secretly appropriated this experience, which it enhanced and strengthened with all the scientific power of the Industrial Military Complex for further use against other countries —Korea, Vietnam and Cuba. Then, another modality appeared in the use of the biological means: bio-terrorism.

The Spanish parasitological expert Luis Najera, in a paper produced in 1946 and published in the *Revista de Medicina Tropical y Parasitología de La Habana*, in an attempt at showing the extraordinary possibilities of the parasitological war —biological warfare— exposed the capacity of these means to cause damage when used in small amounts of infectious material.

The use of biological means by the US government in 1950 against the Republic of Korea is widely known. It resorted to animal vectors, particularly arthropods contaminated with the bubonic pest and anthrax, insects and tick alien to the endemic fauna of the country or which appeared at a time of the year different from the usual.

These aggressions on the Republic of Korea were proven by an international scientific committee which collected the vectors.

During World War II, it was again fascist Germany that enriched its war actions with more sophisticated biological means tested on human beings.

Early in the war, Himler organized a concentration camp destined to biological experiments to implement his principles of "blood aristocracy".

A survivor of the concentration camps narrated how they were used to test biological agents. In the spring of 1943, his sister was

taken with a group of prisoners to Czortkow. She could escape from there after a week without food and receiving injections. They all developed typhoid fever and others became infected, too. Almost everyone who was given the injections died later.

Those biological experiments using concentration camp prisoners as "guinea pigs" were highly significant. The German physicians had all the resources to conduct their experiments. They even boasted of their results, of which no positive experience was obtained to save lives in the future. On the contrary, there was no scientific benefit whatsoever. Human beings were simply sacrificed by the hundreds and thousands; that was it.

According to a survivor named Lengyel, who worked at the hospitals of the Birkenau concentration camp, one of the experiments consisted in the inoculation of pathogen germs. Experiments were conducted on malaria. It is known that the son of the Prime Minister of Hungary was so deteriorated physically that he volunteered for such experiments, since that way he would be given two rations of bread a day for several days.

Powerful German pharmaceutical labs tried their products in these camps. On one occasion they sent a product to treat tuberculosis but after receiving treatment the patients were sacrificed and their lungs sent to the labs for further study. At some point, one hundred and fifty women were taken to these labs in order to try on them unknown hormonal medications.

It has been reported that on the day of the Paris liberation, American troops arrested a group of German soldiers who were keeping guard on a tomb. Later, the US medical information services discovered there an arsenal of products fit for biological war.

On March 20, 1940, Admiral Ellis M.Zacharias, chief of the Navy Information Services, stated on a New York radio station that: "There was enough material in that tomb to spread disease all over Paris. The German soldiers awaited an order to spread taboun[6] gas and the bubonic pest."

It was at that time that one of the gloomiest episodes in the history of experiments with live persons was conducted. As the story goes, abundant "human material" was subjected to the most horrifying tests of resistance to cold and heat, castration and steriliza-

[6] Lethal gas used in biological warfare.

tion, the effects of infectious diseases and the possibility of survival after horrible amputations.

In 1935, after a surgery of the throat, Hitler came up with the idea of medical experiences. He said that it would be only natural to use criminals to solve medical problems, thus opening the way for ruthless experiments with human beings.

Himler's childhood friend, Professor Gebhardt, a physician, a General and secret chief of the SS doctors, said: "Rascher's experiences, ordered by Himler, had been presented to the Fuhrer who decided that human experiences were permitted as long as they were of interest to the State."

In reference to the experiments, Himler said: "...make clinical trials; something might come out of it."

Colonel Winter, whom we mentioned before, was also involved in World War II experiments. He filled the offices of the 3rd Reich's chiefs with letters advocating the use of biological warfare. He stated: "The biological weapon is the only means to combat the British and American on their own soil. An all-out war leaves out moral considerations. It only recognizes the destruction of the enemy at any cost and by all means available that can lead to success..."

Shortly after, and under the supervision of professor Kliewe, for the first time in history a bomb of potato beetles[7] was dropped by planes on the British countryside area of Speyer. These coleopterans, that aggressively devour the potato leafs, were destined to starve the British people. Something similar was tried against France, using prisoners, but the operation failed because these destroyed the coleopterans.

Again, on July 1942, professor Kliewe arranged a bombing on the outskirts of Munsterlager. Later, in his report, he described the results of spreading the germs.

Several biological actions were contemplated in the "Lightning rod" Committee[8] plans, including:

- Inoculation of all Russian prisoners with a grave illness; the outburst would take place two weeks later.
- Releasing rodents infected with either the bubonic pest or the tularemia.

[7] Potato beetle or doriforae from Colorado. It specifically attacks this crop.

[8] "Lightning rod" Committee: code name given to the Nazi committee in charge of biological warfare operations.

- Contamination of water wells with agents carrying cholera, typhoid fever or dysentery.
- Contamination of food with paratyphoid or botulin bacillus, and horse's food with bacillus of anthrax.

All of this material would be sent by plane in small particles, spray, or through the creation of artificial clouds or the dropping of bacteria-carrying bombs. As for the bubonic pest, they planned to drop with parachutes "boxes containing infected rats." Thus, the plan contained an endless list of ways and means of utilization of biological warfare, advanced by the Nazi "genius" to combat enemy forces and the civilian population.

After World War II, the U.S. military have studied the parasite vectors and ticks from many countries in the world, basically at a research center located in Egypt, and associated with the Mediterranean Sea Fleet, and at a laboratory located in Lahore city, Pakistan, linked to the University of Maryland.

In 1954, several Cuban scientists, members of the Cuban Alliance against Bacteriological and Nuclear Weapons, the University Council and the press launched a strong campaign to denounce attempts by the British government to conduct tests with biological weapons in the proximity of our country, in the Bahamas. The argument behind the choice of this area was its distance from the civilized centers. Due to persisting protests, they had previously had to refrain from continuing these experiments near the coast of Scotland aimed at determining the range of action and contamination capacity of the biological means.

In 1956, the news came as a shock to the public: the CIA had planned to drop on the Soviet territory mosquitoes infected with the virus of yellow fever.

Another event was reported in 1971, when the Lahore laboratory caused an outburst of yellow fever in the city with mosquitoes alien to the local fauna and resistant to climate change. They affected 90% of the people they bit, and over 30 of them died. The Israeli Special services were involved in this experiment. That is how that disease was artificially introduced in the Asian continent.

The development of the means to be used in biological weapons experienced a qualitative advance and real momentum when, in 1944, O.T. Avery and his coworkers identified the des-

oxiribonucleic acid (DNA) and the genetic entity which until then had been only a hypothesis, i.e. the gene marking the basis for the further development of molecular biology, genetic engineering and biotechnology.

Based on this novel science, in the laboratories which produce the biological means for combat weapons and bioterrorist actions, scientists combine all kinds of germs, parasites and vectors capable of bringing damages to crops and illnesses to animals and humans and make them resistant to drugs and antibiotics enhancing their most negative features thus creating the so-called "supergerms."

What are biowarfare and bioterrorism?

Faced with the challenge of such a complex issue, and the necessity to have a basic orientation if not a scientific understanding and background, we undertake to navigate in the waters of a sea of concepts and definitions on such a sinister and diabolic "science" that I have defined as 'the science of death.' Our intention is to move the conscience of our readers offering a didactic tool enabling them to understand, repudiate and condemn one of the most terrible crimes committed against many human beings in the world, including our people which has often been targeted by those who want to force it to submit through hunger and diseases, for the only "crime" of wanting to build a society where justice prevails.

According to the definitions found in our research on the subject, as expressed by experts and academics from the same capitalist countries which have developed this type of weapons, as well as by the creators and producers of these means, biological warfare is the deliberate introduction of organisms that can produce illnesses in human, animal or plant populations. The purpose is to bring about economic losses, personal injury or death, and all of this as part of a war or of covert actions, bioterrorist covert actions. This is the definition of this kind of action. These organisms are similar to those found in nature but they are chosen and cultured to become stronger and more harmful than they are in their natural environment.

Some of these organisms, particularly bacteria, can be modified to make them more resistant to the drugs and antibiotics to which they are sensitive in their natural habitat.

Likewise, the most sophisticated genetic engineering technologies make it possible to develop a sort of "supergerms" or new strains for which neither antibodies nor vaccines have been developed.

But, what makes their indiscriminate use so appealing to the imperialist strategists?

SPECIFIC TRAITS OF BIOLOGICAL WARFARE

From the beginning, biological warfare was used in war conflicts but it has progressively given way to the most secret forms of covert action. This is how the military strategists of the Special Services working for the Empire have called it on account of its characteristics that make it so attractive. Other researchers, however, have come to define it as biological terrorism or bioterrorism. The characteristics referred to are:

- Under certain circumstances it is difficult to prove intentionality since the organisms used can be found in nature, and if they are surreptitiously introduced, it can always be argued that a natural, spontaneous phenomenon created the adequate conditions for their development.
- The biological means and weapons facilitate their covert use in sabotage and in subversive and diversionist bioterrorism actions.
- They can be programmed to operate in a delayed-action mode. This means that a considerable time may pass from the moment of introduction until its consequences are detected. Then, it is already too late to locate the direct and indirect culprits.
- These actions can be very easily masked and become rather difficult to detect since most of the biological agents are microscopically tiny.
- Finally, a very small amount of agents is required to obtain the targeted result given the self-reproductive capacity of these agents.

WHAT'S A BIOLOGICAL WEAPON?

A biological weapon is one whose destructive action is based on the use of pathogens that cause infectious diseases in humans, animals or plants. The concept includes the weapon carriers.

WHAT'S THE MEANING OF BIOLOGICAL AGENTS?

These are the pathogen microorganisms used in the bioweapons. They are generally microscopic, odorless, colorless and insipid; they belong in the animal or plant kingdom and can be easily reproduced under favorable conditions.

The following are among those used in biowarfare and bioterrorism:

- Bacteria;
- Virus;
- Rickettsias;
- Fungus;
- Toxins of biological origin;
- Parasites such as protozoa, helminthes, etc.

Among the animals used as carriers are mosquitoes, flies, fleas, ticks and other bloodsucker arthropods as well as different types of rodents, mammals, migratory birds, and so forth.

CLASSIFICATION OF THE BIOLOGICAL MEANS

The classification of the biological means is basically done according to their high degree of specificity with regards to the final host. Thence the division in three groups:

- The agents affecting man.
- The agents affecting animals.
- The agents affecting plants.

Additionally, there are the diseases known as zoonosis, which are animal pathologies communicable to humans and affecting both. There is also another classification of the means affecting man depending on the degree of the harm they cause:

- Incapacitating means.
- Lethal means.

The incapacitating means are specially valued for armed conflicts since they temporarily incapacitate the man knocking him out of combat and creating the need for others to evacuate him

and care for him thus taking various people off combat missions.

The lethal means are, of course, those causing death. This group includes the biologically originated toxins such as botulinum toxin[1] widely used in assassination attempts by poisoning. This means has been used several times in assassination attempts on Commander in Chief Fidel Castro.

Due to their effects, both means are indistinctly used in covert actions. This has been confirmed in the bioterrorist aggressions carried out against Cuba.

MAIN WAYS TO INTRODUCE BIOLOGICAL MEANS IN THE FINAL HOST

The final host is the individual of a given species that can be affected by microorganisms and that can then suffer from certain pathology or even die.

Depending on the way the individual from a certain population is infected the following means of introduction are identified:

- Inhaling;
- Microbes contact with human or animal skin, or the plants' leaves;
- The sting or bite of carrier agents known as vectors;
- The ingestion of contaminated food, water or other substances;
- The direct or indirect contact with contaminated objects, people, animals or plants.

PROPERTIES OF THE BIOLOGICAL MEANS

The biological means have certain properties which make them appealing as weapons. These are the following:

- High potential coefficient, that is, only a tiny amount of microorganisms is required to cause a great damage, thanks to their fast reproduction in certain environments;

[1] Relative to botulism. Poisoning caused by the toxin derived from the metabolism of the bacteria known as *Clostridium botulinum*

- Creation of epidemics, epizooty and epiphytes. This alludes to the capacity of the biological means to expand to other individuals due to their infectious-contagious nature.
- Incubation period. This is the time it takes the pathology to manifest after the means or agent has penetrated the final host. It depends on the type of agent used, the environmental conditions —humidity, temperature, etc.— the characteristics of the host, that is, its sensitivity, and other factors that may, or may not, favor its reproduction.
- Difficulties in detection. This refers to the time passing before the event is detected, which delays the diagnosis and its exact determination. This property of the biological means, combined with the previous one mentioned, is precisely what makes them so appealing for bioterrorist covert actions, as it is almost impossible to immediately discover the perpetrators.
- Specificity. It is possible to choose biological means to strike on specific areas or targets, i.e., people, animals or plants. Or choose from these species whether farm birds, pigs, cattle, a specific crop, etc.
- Persistence. This is the capacity of the biological means to resist the environmental conditions —humidity, temperature, etc.— and remain in the affected areas for a long time.
- Virulence or pathogenic nature. It's the property of the biological means to make the pathologies more or less severe. In general, there are highly, medium and low pathogenic strains, known respectively as velogenic, messogenic and lentogenic strains. The latter are counted among the most commonly used for vaccines in order to prevent certain pathologies or protect against them.

Some of these properties, particularly virulence and resistance, are modified to be used in biowarfare through the creation of the so-called supergerms.

HOW ARE SUPERGERMS PRODUCED?

In 1928, Dr. F. Griffith was able to transform the neumococcous serotype I into serotype II, by inoculating laboratory mice with a

combination of live serotype I non-virulent bacterial cells and virulent serotype II killed by heat. In the subsequent sub-cultures this serotype II was replicated, thus, for the first time he experimentally achieved the transference of a hereditary character. This, and further studies proved the existence of a transforming principle.

In 1944, O.T.Avery and his coworkers made another breakthrough in this discipline called genetics when they identified this principle as Desoxirribonucleic Acid (DNA) (2). Likewise, Avery was the first to point to the chemical identification of a genetic entity, which had been a hypothesis until then: the gene.

The most significant contribution to molecular biology would follow a few years later, when in 1953 J.L. Watson and F. Crick, —based on previous data from Chargaff, on the roentgen structural analysis material, on the principle of the gene theory and on the role of analytic data— created the pattern of DNA molecule composed by two polynucleotide chains spiraling one around the other.

The Watson-Crick Pattern offered new approaches to research into the most important genetic phenomena. Thenceforth, the specific nature of the mutual disposition of the nitrogen basis would be treated as the genetic code. The analysis of the chemical variations in the composition of the nucleotides served as the basis of the Molecular Theory of Mutations, while the double structure of the DNA molecules explained the principle of the molecules self-duplication, through the synthesis in the matrix starting from the principles of the structure and the importance of the different elements in the DNA molecule.

These discoveries were the basis of the further development of molecular biology, genetic engineering and biotechnology. In the same token, these sciences are of special interest for the development of very important disease-resistant species as well as for the development of a number of pharmacologic products and diagnosis means of great benefit to man.

However, it would not be long before the researchers of biological means for warfare and bioterrorism perceived the potential of these sciences for their particular objectives.

The transformation method allows for the modification of the virulence and of the bio-chemical properties of some biological means as well as for the transference of genetic characters through the incorporation of an alien DNA.

The fact that the DNA can change its chemical structure enables to understand the mutation process, which either naturally- or artificially- provoked indicates a modification of the DNA chains. In the case of mutation, the somatic, morphological, biological or biochemical changes are expressed as manifestations of a change in the structure of the genetic material. The artificially-provoked mutation is another method employed in the production of biological means.

The hypothesis exists that events such as AIDS (Acquired Immunodeficiency Syndrome), whose origin is yet unknown, and Ebola as well as other modern pathologies, may have been the result of these macabre experiments destined to transform and to create new biological means to be used in combat.

Other known methods are cloning and clone splitting to reproduce individuals of the same species or race, or to isolate highly pathogenic particles from strains which initially lacked such aggressive virulence. Thus, there are multiple and increasingly sophisticated methods that can be used for good or evil purposes.

Biotechnology and genetic engineering applied to agriculture have led to the creation of a variety of crops non-existent in nature. This has been done through a method known as cell fusion that merges two cells from different vegetables to obtain an unknown hybrid.

A similar method can be used to artificially produce new diseases and biological means aimed for the military and for covert bioterrorist actions.

WAYS OF PRODUCING, USING AND SPREADING THE BIOLOGICAL MEANS

Thanks to research many ways have been identified through which the biological means were introduced and spread —including cases of aggressions targeting our country. The consulted bibliography refers to some used basically in warfare and bioterrorism. However, the investigative work conducted and the experience accumulated by the Cuban scientists, as well as the information provided by enemies and terrorist agents and officers who have taken

part in such actions and admitted that much, has led to the confirmation of the already established ways while others have been disclosed, specially related to covert bioterrorism.

The various modalities include:

- Bombs, packages or devices dropped from planes;
- Projectiles and rockets;
- Spraying equipment used to create an aerosol cloud;
- Aerosol sprays;
- Contaminated animals;
- Intentional contamination of diagnostic kits and vaccines;
- Contamination of medication;
- Modification of medications' and pesticides' formulae;

The ways to introduce and spread the "classic" and the newly discovered means include the following:

- Wild animals;
- Migratory birds;
- Cetaceans and other marine mammals, trained or contaminated;
- Draft and ocean currents;
- Introduction (in the target country) of biological material or contaminated medications;
- Modification (in the production process) of medications, biological products and vaccines;
- Use of international air corridors to drop from the aircrafts devices carrying the biological means;
- Violations of the air space;
- Introduction of biological agents through people, animals or vectors. This has been done from Guantanamo Naval Base. In some cases the non-contaminated vectors are introduced followed by the biological means to facilitate dissemination;
- Intentional altering of laboratory analysis and tests. For example, in 1974 Cuba found out a scientific researcher in a laboratory who was a CIA agent involved in such activities.
- The work of experts recruited by the special services of imperialism or people who cover their true intentions with legal positions in foreign scientific institutions or international specialized agencies.

The Cuban experience shows that many suspected or confirmed actions take place in the proximity of international air corridors, as it was the case with the introduction of hemorrhagic dengue, and the confirmed introduction of the Thrips palmi karay plague later on.

HOW ARE BIOTERRORIST ACTIONS PLANNED AND IMPLEMENTED?

The same as any crime against humanity punishable by law, the covert bioterrorist actions carried out against Cuba exhibit a specific *modus operandi* exhaustively proven by the specialized Cuban researchers and scientific authorities.

STAGES OF DEVELOPMENT OF THE BIOTERRORIST COVERT ACTIONS (*MODUS OPERANDI*)

A simple analysis of the objectives of the aggressions perpetrated against Cuba, and their very high costs, presupposes minimal conditions and previous information on possible effects.

Based on the experience accumulated fighting the bioterrorist covert actions on Cuba, and the studies conducted by Cuban scientists in response, the *modus operandi* of the United States of America's special services was identified; it was determined that they act in three stages:

First stage

The enemy, through its agents and thanks, among other things, to the information lost during academic scientific exchanges, obtains the necessary information on the area it intends to strike, choosing the adequate biological means and the possible ways to introduce it in the country, as well as every details required to execute the action and cover it up.

Such information includes, basically, existing and non-existing diseases and plagues; the existing means of control or vaccines; the pesticides the country may count on to fend off a certain event;

the existing and non-existing medications; the types of cattle in the country; the varieties of sugarcane and other basic crops; the sensitivity of these crops, or animals, to certain plagues or diseases; the type of vaccination practiced in the country; the density of several vectors and the state of the control campaigns. The work developed for every action and the previous CIA work of scientific espionage, described later, show every step taken by the aggressors.

The collection of all the necessary information is followed by the planning stage and, finally, the execution of the action.

Second stage

This is the stage when the enemy uses its agents to introduce the biological means in the country thus executing the aggression with the subsequent impact on the selected area, population, species or crop. Then it waits for the results to show.

It's almost impossible to detect this action right away, unless you have previous information or discover the agent *in fraganti*, which happened, accidentally, during the introduction of the Thrips palmi. On the other hand, given the incubation period of the biological means, when the consequences show, the perpetrators are no longer around. This is one of the peculiarities of this type of aggression.

In general, the people involved in this kind of missions are highly reliable, so the secret can be safe.

The action can have various aims such as damaging the economy or people's health, sawing panic in the population and having a political impact.

In Cuba's case, the possibility exists to surreptitiously drop the means from aircraft legally using the international corridors, or violating our air space. The introduction of agents or means into the national territory can be done through the Guantanamo Naval Base. This happened already a few years back with actions on the island.

As for the altering of diagnosis and laboratory tests, and the contamination of medical formula and other products, they can employ nationals, as in the case mentioned above where the agent manipulated the results of the laboratory analysis.

Likewise, the history of bioterrorism registers information on the intentional contamination of vaccines destined to animal protection, with infectious agents of other pathologies. Such an event took place in the first years of the Revolution.

Third stage

Once the terrorist aggression has been accomplished, the enemy services conduct a series of actions aimed at identifying the details of the consequences and at recovering the means employed. This they do for further study and, of course, as proof of the action, so that the bioterrorists —the mercenaries— can collect their payment. They also need this information to jeopardize the measures taken to counteract the aggression.

First, everything possible is done to obstruct the measures taken by the country for its protection and to eliminate the consequences. They hinder the acquisition of the resources necessary to counteract the action. This was the case during the hemorrhagic dengue fever when they blockaded every attempt made to buy the pesticides and other indispensable resources.

At this stage, they try to recover, for further use, the strains or biological means they have used. Additionally, they mask their intentions under another façade to be able to study the results obtained. Through prestigious scientific institutions or international agencies, with the alleged purpose of "assisting in the investigations" and "contributing to solve the problem", they try to influence the specialists through the relations these have with their colleagues in said institutions, whom they usually knew from previous academic and professional exchanges.

Conditions facilitating the aggressions:

- The existence in our territory of three international air corridors daily used by 300 to 400 aircrafts;
- The presence of the American Naval Base in Guantanamo, an area illegally occupied and used for multiple such aggressions;
- The fact that Cuba is an island nation which makes it possible to use the draft and ocean currents;
- Cuba's proximity to the territory of the United States of America and other countries in the Caribbean basin;

- Cuba's geographical position in the area used by migratory birds coming from North America. The United States has studied these birds for over 50 years, which enables them to use these knowing that they live in a certain place and head every year for the same place in our territory. In at least two cases of actions against our livestock, this was established as the likely method of introduction.
- The economic blockade imposed on Cuba, for over four decades, and its direct impact obstructing the purchase of medications, reagents, diagnosis kits, pesticides, foodstuff as well as the necessary resources to remove the consequences of their actions.
- The academic and scientific exchanges with experts from the United States and other capitalist countries. This has allowed them to obtain information from legal sources on areas previously targeted for action.
- The necessity to import medications, reagents and other means from capitalist countries that can be sabotaged along the way. This has happened on various occasions.

The United States of America, biowarfare and bioterrorism

In the framework of a report elaborated in May 1969, for the Labor and Welfare Committee's Special Subcommittee of the National Science Foundation, where the history and nature of biowarfare were analyzed as well as the likely advantages of a system of biological weapons, U.S. officials recognized the growing financial support for the development of such weapons which in 1969 already amounted to over 175 million dollars earmarked for research. (See "Annexes and Tables")

The report indicates that:

"It's difficult to prove responsibility in case of an attack, since the responsible organisms abound in nature under various forms, and if they are sent surreptitiously, it could be argued that the situation is the result of a spontaneous epidemic. The effectiveness of large scale biological strikes on unprotected populations can be compared to the effect of a nuclear weapon. The crops are vulnerable to the biological attacks (...) The biological weapons are extremely adequate for such covert actions as sabotage."

That same year, President Richard Nixon publicly announced a ban on the production, development and use of this kind of weapons. He said that only the "defensive medical research" would continue aimed at protecting the American troops from such an enemy attack.

Nothing could be further from the truth. The Pentagon and the CIA intensified their research and development of this type of weapons, and the bioterrorist aggressions against Cuba and other countries in the 1970s and 1980s.

Millions of dollars are allocated every year, as part of the budget of the Military Industrial Complex, to develop and produce the agents and the bioweapons. Thus, the United States started on the path to its nefarious creation: bioterrorism.

The logistics and the resources employed include a large number of research centers, inside and out of the U.S. borders. A small list of the most important among them would suffice to reveal the skyscraping figures allocated to this end. Some of these centers shall be discussed in this book, together with a considerable number of scientific and academic institutions that although not directly implicated with military centers or subversives agencies, do work for them on "juicy" contracts, and committed to secrecy.

The book entitled *Chemical and Biological Warfare: America's Hidden Arsenal*, by American author Seymour Hersh, offers a description of some U.S. facilities where biological weapons are developed.

The Edgewood stockpile is an enormous facility, located northwest of Baltimore, employing over 4000 civilians and 1000 military, whose budget grew progressively until its peak during the Vietnam War.

In Maryland, Fort Detrick, with its 1300 acres employs 2500 civilian and 500 military and basically develops and produces biological agents. To that end, it receives the necessary inputs which are tested right there. One of its most important programs relates to research on the use of disease-carrying insects, which include the mosquitoes that transmit yellow fever, tropical fever and malaria; ticks and others infected with typhoid fever, and the Colorado fever; fleas that carry the bubonic pest; flies that carry cholera, anthrax and dysentery.

At this center experiments are conducted with millions of mosquitoes carrying yellow fever. Approximately half a million of them are incubated and contaminated every month. In the 1980s, a biological center was established where up to 130 million disease-carrying mosquitoes could be produced monthly.

Other similar interesting centers are the following:

- The Pine Bluff Stockpile in Arkansas is one of the main stockpiles of chemical a biological weapons (CBW) of the United States Army.

- The Naval Biological Laboratories in Oakland, California, basically address research in developing biological agents.
- The Rocky Mountain Stockpile in Denver, Colorado, fundamentally produces chemical weapons.
- The Chemical Plant of Newport, Indiana, is tasked with the production of neurotoxic gases.

THE CENTRAL INTELLIGENCE AGENCY (CIA) AND BIOTERRORISM

In addition to the abovementioned entities, the Central Intelligence Agency of the United States of America has the Technical Service Division (TSD) in charge, among others, of very important missions related to the development of bioterrorist actions.

The TSD offers technical support to all of the operations run by the CIA operations subdivision. In addition to the operative technique, it stocks and provides the operative units with bio-chemical agents for special operations.

The TSD is based in the South Building, in Washington D.C. while in the CIA headquarters in Langley, Virginia, sits the TSD's coordinating office under the name of Requirements Branch.

The TSD also has regional basis in Frankfurt, Okinawa and Panama. Inside the TSD, the departments more closely related with biowarfare and bioterrorism are those of armament and explosives, and toxic substances.

Still, a number of other agencies work directly with the CIA in the preparation, research, development and production of the biological agents to be used in bioterrorism. The most outstanding among them are:

- Dazeltine Laboratories at 9200 Leesburg, Pierce, Vienna.
- Dazeltine Research, Animals Inc., tasked with supplying laboratory animals required for the experiments and production of biological agents.
- U.S. Army Chemical Warfare conducts biological research on animals and plants.
- U.S. Army Chemical Warfare Laboratories, Anniston, Alabama, destined to researching and stockpiling lethal gases and liquids.

- U.S. Naval Test Facility, China Larce, California, specializes in transportation systems, particularly for chemical and biological substances.
- National Institute of Health, Silver Spring, Maryland, performs the human evaluation of the effect of the biological and chemical agents after they have been used.
- Additionally, the Smithsonian Institution and the Fish and Wild Life Service, where research is done on subjects related to migratory birds and other animal species that might be used as vectors. The results of the work of both entities are used by the CIA experts in their actions.

UNITED STATES INSTITUTIONS AND UNIVERSITIES WORKING IN THE DEVELOPMENT OF BIOWARFARE AND BIOTERRORISM

The United States of America counts on sophisticated scientific institutions to provide scientific support to the research, development of biowarfare and bioterrorism and to the improvement of procedures for its use and dissemination. Many of these are not run by the Army or the Special Services, but they do work for these entities under contract. They receive large sums of money for their development usually affected by budget cuts imposed on the educational and academic system.

On the other hand, financing is unrestricted when it comes to the development of the arms race and the military industrial complex. Suffice it to say that from the 1960s they had contracts with over seventy colleges and private corporations from all over the world.

Additionally, the United States administration relies on a number of agencies which monitor this research complex, among them, the Directory of Research and Engineering, the Defense Scientific Board, the President's Science Advisory Committee and the Jason Division in the Institute for Defense Analysis.

The following are counted among the scientific research centers which have been working under such contracts and in various projects:

- University of California; The Lawrence Radiation Laboratory works on nuclear weapons and on medical research.

- Naval Biological Laboratory; it mainly addresses microbiology and aerobiology, that is, the study and utilization of air to disseminate infectious diseases. One of its main contracts is associated with the performance of biological agents sprayed from planes.
- Berkerly; it conducts research on microbiology and aerobiology. It has studied the way of spreading the bubonic pest, the coccidiomycosis and meningitis.
- Los Angeles, where pharmacologic studies are conducted to find new chemical agents, both incapacitating and lethal. This center has also studied agents that affect the central nervous system.
- Cornell University; The Cornell Aeronautical Laboratory works on aerodynamics and space technology, but also on chemical and biological warfare.
- Illinois Institute of Technology; its main area of interest is chemical and biological warfare. It has become the main research center in aerobiology.
- Chicago conducts research on the manufacturing of chemical bombs and to spread nerve gases. It has done studies on aerobiology, particularly with regards to equine encephalomyelitis.
- University of Oklahoma; it has worked on research associated to chemical and biological warfare.
- University of Stanford; this is one of the most prestigious research centers in the United States. It has been involved in studies on the dissemination of solid and liquid chemical and biological agents.
- Menlo Park; it has been one of the main institutions linked to research for the chemical and biological warfare. It has studied and tested a great number of biological agents and dissemination techniques using the gas clouds from aircraft engines.
- University of Texas; The Defense Research Laboratory does research into chemical and biological warfare.
- University of Connecticut, Storrs; it conducts studies for the production of LSD, as well as experiments to test the psychedelic effect of this drug on people.
- Johns Hopkins University, Baltimore; it has worked on diseases that could be of interest to biological warfare.

- Kansas State University; its research is linked to nerve and lethal gases.
- University of Maryland; its studies have been geared to determine the vulnerability of humans to biowarfare, through experiments with animals and voluntary people recruited among those serving life sentences in state prisons.
- University of Minnesota, Minneapolis; its experiments have addressed chemical and biological agents aimed at destroying crops and food.
- Saint Louis University; this has worked on chemical warfare to determine the effect of certain drugs and toxic compounds on humans.
- University of Washington, Seattle; it is basically devoted to chemical warfare. It has done research on the skin penetration of certain drugs and toxic agents.
- Washington State University, Pullman; its research for biowarfare are related to damaging crops and food with biological agents.
- Pakistani Medical Research Center, Lahore city, Pakistan; this is run by the University of Maryland. Here they breed mosquitoes and other vectors of infectious diseases. Plans have been made to introduce encephalitis in Afghanistan. In the very city of Lahore, there was an outburst of yellow fever linked to local mosquitoes. Other people were affected by icterus hepatitis and some, who were also bitten by the mosquitoes, went mad. Here they conduct experiments with human beings bitten by mosquitoes. Its director has said that they "prepared the mosquitoes for the hemorrhagic dengue fever aggression on Cuba in 1981".
- Air Base at Torreon de Ardoz in Spain; this is a joint American and Spanish air base. In September 1982, journalist Jose Luis Morales from *Interview* magazine denounced the stockpiling of chemical and biological weapons in this facility and the intensification of this activity and the transfers of a lot of material to the Spanish base after denunciations of the work done at the Pakistani center. Thus, the accidents that had taken place in this facility, which had brought illnesses and death to American troops and Spanish workers in the base, became known.

CONTROL OF THE HUMAN MIND

Although this subject is not directly related to biological actions but to chemical warfare —another sinister creation of the empire— it becomes necessary to elaborate on its relation with the human life, as it shows how far the research of the science of death is willing to go.

The research of the U.S. Army on "psychochemical warfare and control of the human mind" started as early as 1952. It was then that the Army Chemical Corp hired the services of a team from the Psychiatric Institute of New York to delve into this subject. These studies were monitored by an outstanding psychiatrist, Dr. Paul Hoch, who would later be chief of the Department of Mental Hygiene in the State of New York.

From the beginning of the project a number of people entered the list of the dead. One of the first patients included in the experiments died after receiving an excessive dose of MDA. This was a by-product of mescaline, popularly known as the "love drug".

Dr. Hoch continued his experiments and became CIA advisor. As part of these experiments, psychiatric patients were given high doses of MDA and LSD; later they were subjected to lobotomies[1] in order to confirm the effect of these substances. According to information published in *The Village Voice*, in one of the experiments the patient was given local anesthesia and then a shot of a hallucinogen; then he was asked to describe his visual experiences while a surgeon extracted part of his brain.

At the end of the 1950s, the abovementioned Edgewood Stockpile in Maryland, —seat of the Chemical Corp headquarters— received every month approximately 400 faulty products from the major pharmaceutical companies in the United States. These medications were rejected for their adverse effects, inconvenient for their pharmacological use; however, they were used in military research, as this was precisely the objective.

For example, Hoffman-Laroche Inc., from Nutley, New Jersey, was the firm that supplied the army with the first sample of BZ gas, and the military specialists were the ones who discovered that this substance inhibited the production of a chemical substance which

[1] Surgery of the brain lobes.

facilitates the transmission of messages throughout the body's nerves terminals, thus disturbing a person's normal perceptive patterns. The effects of this substance on the body lasted at last three days, while some symptoms like headache, dizziness, disorientation, auditory and visual hallucinations, persisted for several weeks.

Later on, the CIA Research Bureau joined the Edgewood Stockpile and the Defense Chemical Corp in a project to create new compounds that could be used offensively. A CIA memorandum dated March 8, 1971, shows that a reserve of over 26,000 drugs had been purchased for future selection.

Between 1967 and 1975, no less than seven hallucinogens more powerful than the BZ had already been tested; some were tested on inmates in the penitentiary of Holmberg, Pennsylvania. Rather little is known about the results of these experiments but CIA papers refer to accidents in laboratories like the case with the drug known as EA-3167, which caused prolonged psychotic effects on the people exposed to it.

Led by CIA biochemist Dr. Sidney Gottlieb, the Agency and the Pentagon sponsored the LSD project and used physicians from psychiatric hospitals, prisons and even army units to administer the drug to people and study the impact.

From 1953 until 1975, close to 5000 people were systematically drugged. These were unwilling "guinea pigs". The results of these experiments were contained in 152 files classified as "strictly confidential", which were in the hands of Dr. Gottlieb who destroyed them before vanishing from the United States of America.

All of these projects were revealed at the end of July 1975 by the Rockefeller Commission, which, due to public pressure, investigated the CIA illegal activities.

According to *The New York Times*, the CIA invested over 25 million dollars in these research contained in an operation under code name 'Blue Bird' later changed to 'Artichoke', and then to 'MK-Ultra' or 'MK-Delta.' These tests included everything related to the transformation of the human mind and used from toxic substances and drugs to biological agents. To cover up these actions, the CIA received the funding from private firms and organizations created to this end. One of them was the Gestshikter Foundation, in Washington; this "donated" 40 thousand dollars to Georgetown University for special research.

Another entity involved was the Human Ecology Research Society, from Cornell University, ran by Harold Wolff and Lawrence Hinkle. This one was tasked with research on the superior nerve activity and the human brain with the intent of producing methods and substances to control it.

The CIA even used the Psychiatry Institute, attached to the McGill University in Montreal, Canada, specialized in methods of memory transformation and erasing. For these tests they used nurses from the clinical center, as well as inmates from the Atlanta Federal Penitentiary, in New Jersey, under the leadership of well known pharmacologist Carl Pfeiffer; also Harris Isdel from the New York Hospital Mount Sinai; and Luis West, from the University of California in Los Angeles.

ADDITIONAL INFORMATION AND EXPERIMENTS CONFIRMING THE USE OF BIOLOGICAL AGENTS

The U.S. Senate report proves and admits that the secret budget allocated to develop chemical and biological weapons grew every year and that if in 1961 it amounted to 57 million USD, in 1969 it had increased to 350 million.

On many occasions Washington has secretly tried air dissemination of biological agents over populated regions in the continental United States, thus turning children, women, men, elders and representatives of the ethnic minorities into "guinea pigs".

This is evident in the experiments conducted from 1932 through 1972 in an Alabama county, where over 400 black citizens infected with syphilis were withheld treatment, in order to follow the evolution of the disease and establish the differences of this process in the black and white population. Something similar was done with pregnant women whose children were then born with the disease.

The Health Care Services offered a supposedly free treatment consisting of painful punctures; they were really trying a diagnosis method. When these people died from the disease they were offered free funeral services, so that an autopsy could be performed with a view to the anatomical pathological studies that would conclude the experiment.

There is also public information available on 400 inmates from Chicago prisons who were deliberately infected with malaria in order to try various treatments of the disease.

In the year 2001 it became known that between 1954 and 1973, over 2000 U.S. soldiers, followers of the Seventh Day Adventists religion, who based on their religious belief refused to join the Military Service, were subjected to terrible experiments such as exposure to various illnesses; due to this, some of them later suffered from cancer.

In 1950, bacteria causing an illness similar to pneumonia were disseminated over the San Francisco area. Between 1952 and 1953, several biological agents were spread on Saint Louis, Minneapolis, and in 1953 the same was done over the Canadian city of Winnipeg.

In 1955, a 300% increase of whooping cough cases occurred; the epidemic broke out in an area of the Florida state where, according to later disclosed CIA papers, the sinister Agency carried out bioterrorism experiments and tests.

In 1966, biological agents were disseminated in 4800 square miles of Texas, and later, in June that same year, the U.S. army deliberately introduced a bacterial agent in the New York City subway.

The CIA spy work on Cuba: in search of information for bioterrorism

All throughout the revolutionary period in Cuba, the CIA has never ceased to engage in espionage to obtain the information required to plan its actions. The search for information to plan bioterrorist aggressions, the creation of the necessary biological agents and the recruitment of wage-earning terrorists to execute their plans are well known to our people. Quite often the Cuban counterespionage and intelligence services have unraveled and exposed such plans.

The warnings made in early 1987 by Commander in Chief Fidel Castro to both the CIA and the U.S. Interests Section in Havana —its instrument on the island nation— and his invitation to refrain from their aggressive work were ignored by the government and the Agency.

The Cuban intelligence and counterintelligence services, moved by their legitimate right to defend and preserve the safety of the State, undertook to finding out, monitoring, preventing and dismantling each and every action. As part of this work, a group of brave Cuban patriots properly trained for their anonymous task, were able to infiltrate the enemy ranks and keep our government informed of such dreadful actions.

The sabotage, terrorism and espionage, the assassination attempts on the top leaders of the Revolution and the economic blockade were all exposed and adequately responded by our people. There was also a response for bioterrorism. In some cases the imperialists' interests and preparations were timely discovered.

That same year, and in view of their contempt for the said warnings, the Cuban State made the decision to expose a large part of

the CIA work disclosing the true identity of 27 secret agents of the Cuban Security who for several years had supposedly worked for the CIA.

In press conferences and public interviews, as well as in the oral hearings held in an open tribunal on the damages caused by the United States to the island nation, some of the double agents made revelations about the work of the CIA to conduct biological terrorism against Cuba.

For years the CIA, through its agents in Cuba, has showed interest in the following issues:

- Whether the Cuban press was publishing anything about an epidemic affecting the laying hens. A month later an epidemic of the disease known as Newcastle was detected; a biological aggression was confirmed.
- Who had bought the substance known as *abate* to control the plague of mosquitoes Aedes aegypti; how much had been bought and where. The objective was to blockade the acquisition of said product.
- How many people were affected by the hemorrhagic dengue fever, as reported by the press, and if there were strong rumors that it was the work of the CIA.
- State of the dengue epidemic in Cuba; if the bank of the Almendares' river had been intensely fumigated.
- CIA officer Eugenio Martinez said to an agent that the actions against Cuba would increase in the future, and that they would basically target the economy. He volunteered the possibility of using bacteriological agents to hit the cattle and the introduction in the country of the Mediterranean fly to damage the citrus plantations.
- The consequences of the swine fever and the present situation in this regard.
- The consequences of the dengue epidemic on the Cuban population.
- The plagues impairing the sugar industry.
- The plague attacking the mangroves in the eastern provinces, particularly the area of Maisí.
- The situation with the diseases adversely affecting the cattle, mainly in the province of Camagüey.
- Diseases attacking the cattle. Damages caused.

- Any new diseases hitting the tobacco plantations; damages to the crop.
- National infestation rate with the mosquito Aedes aegypti.
- Immunological condition of our population.
- Whether there had been cases in Cuba of Lassa fever, since Fidel had referred to the campaign to eliminate the rats.
- National infestation rate with rats.
- Damages caused by the rain; if they had brought any damages to tobacco, tomato and potato plantations; diseases that could show up associated to the heavy rains. Availability of the necessary pesticides to fight the plagues.
- The plagues that could hurt the tobacco plantations.
- The names of the diseases suffered by the Cuban troops in Angola.
- Data on the main sugarcane varieties, of which there are large plantations, and that according to the CIA officer are being contaminated with an old disease "(...) I think they will start demolishing those plantations and plant them again; then we will make them sick again, and so on and so forth".
- Means in the hands of the Ministry of Sugar Industry (MINAZ, by its Spanish acronym) to detect plagues and to tackle them.
- New diseases impairing sugarcane in Cuba which might be considered serious; evolution of these diseases.
- Whether the blue mold or the rust has been removed from the sugarcane plantations or if they are still a threat.
- Whether any new diseases are impairing sugarcane in Cuba or if the MINAZ is concerned in anyway.
- Information on detection methods established for sugarcane disease control.
- Possibility that the USSR may supply the herbicides and insecticides; what types and how much.
- Updated information on diseases suffered by the Cuban troops in Africa; the types of illnesses, severity of the condition, number of people affected, public awareness and reaction.
- Names of the Cuban experts in military medicine and their present location.
- Medications bought by the Public Health Ministry (MINSAP, by its Spanish acronym), quantities and suppliers.

- Whether Cuba has any center specialized in caring for patients burned in the war with chemical and biological substances.
- Names of doctors specialized in these treatments and where from they obtained their knowledge.
- A CIA officer said that he was familiar with a report from MINAZ on sugarcane vulnerability to certain diseases and requested information on any measures being taken in this connection.
- Whether there was a higher incidence of animal diseases in Cuba.
- The condition of sugarcane: areas under cultivation, most severe diseases, and prevention and control methods.
- Any information about new pests impairing sugarcane plantations.
- The most harmful sugarcane diseases; whether technicians have succeeded in fighting them. Details of the budget allocation.
- Whether there were any pests in the Gregorio A.Mañalich agricultural industrial complex in Melena del Sur.
- Characteristics of the Fidji disease and its potential effects on sugarcane.
- The problems with chlorine and water in Cuba and whether anyone was sick as a result.

Many of these issues of interest for the CIA were often reiterated by more than one agent.

CONFESSIONS ON BIOTERRORIST AGGRESSIONS ON CUBA BY A FORMER CIA OFFICER

In August 1983, during an unofficial visit to Cuba, a former CIA officer revealed some very interesting materials and methods related to bioterrorism against our country. He also mentioned certain events related to cases detected by the Cuban authorities, and explained the following:

That he was aware of the introduction of hemorrhagic dengue in Cuba and of the preparations of a masked artifact —a bulb-like

device— to illegally introduce part of the biological material through the Jose Martí International Airport. The first cases of the disease were reported precisely less than a mile from that place in Havana City.

That he had learned from a colleague that a covert action against Cuba was brewing that would use biological agents to bring serious damage to the Cuban people. The same person had volunteered the names of various people, from the 10 or 20 that would be involved in said action, most of them physicians and specialists.

That some of those in charge of introducing the material in Cuba would probably do so through Canada, posing as tourists and with false passports.

In 1980, while talking with a doctor that took part in the action, she had told him: "Now that we have power and control over them," meaning Cubans, "we can do as we wish and before long we will have evidence of what our friends did in Cuba".

As for the African swine fever, he said that although he was not familiar with the details of the operation, he did know that the CIA was involved. He had news of an experiment inside the U.S. territory where a number of pigs were inoculated to test the performance of the strain.

On the methods and rules for the use of biological agents, he said that:

- The officers working against Cuba make their proposals based on the information they have and the potential political and economic damage of their actions.
- The U.S. Army is used as a façade to cover up research on these diseases, always trying to experiment in conditions similar to those of Cuba in order to determine the effectiveness, possibilities of dissemination as well as other details.
- In this token, the CIA and the Pentagon have practically all the strains with the most diverse illnesses since the CIA enjoys very close relations with the main scientific institutions of the U.S. government.
- The means are introduced by highly reliable persons or agents who are unaware of the specifics of their tasks. They should pretend not to be Americans or coming from that country. They commonly travel from Canada by plane.

- They ensure that these people or agents make no contact with the diplomatic mission, in this case the USIS (U.S. Interests Section) in Havana.
- The economic factor is much valued, that is, that the action brings about great losses and has a political impact.
- The eventual damages to the United States are seriously pondered given the geographical proximity between the two countries.

Cuba targeted by the bioterrorists. Proven and unproven cases of bioterrorism on Cuba; admission by the United States

Although it is almost impossible to catch the Special Services *in fraganti*, despite their direct involvement in most cases, and the subsequent investigations after every aggression, it has been established that the natural phenomena are inconsistent with the events.

The direct involvement of U.S. officials or their wage-earning mercenaries; the unexplained occurrence of the events in the proximity of international air corridors; the signs left by suspicious people during the first stage of the action and which directly correspond with the event detected; the direct relation between some events and the information interests evidenced by the CIA are all factors confirming the Special Services bioterrorist actions.

In a study on disarmament and chemical, biological and radiological warfare elaborated by the U.S. Senate Foreign Relations Committee's Subcommittee on Disarmament, in August 1960, a list of pathologies —attacking humans, animals and plants— is presented as weapons stockpiled by that country for the biological war. These means effectiveness in covert actions is also recognized.

In a report made public in 1975 by the U.S. Senate Commission chaired by Senator Frank Church that investigated the CIA plans to assassinate the leaders of other countries, it reads:

"We have found concrete evidence on at least eight plots with CIA involvement to assassinate Fidel Castro, between 1960 and 1965. Although some of the plots didn't go beyond the planning and arrangement stage, one included the participation of characters from the underworld which on two occasions reached the point of sending poisonous pills to Cuba and the groups to perpetrate the

action. Another plot involved supplying a Cuban 'dissident' with weapons and other devices fit for murder. The devices included from long-range rifles to poison pills, poisoned pens, lethal bacteria and others demanding a great stretch of imagination".

According to the same report, among other assassination plans and actions on the Commander in Chief mentioned in a report by the CIA Inspector General it is said that: "The Operations Division of the CIA Bureau of Medical Services supplied an official with a box of Castro's favorite cigars and instructions to give them 'lethal treatment'. The cigars were inoculated with a botulin toxin so powerful that a person could die from simply holding one with the lips. The official reported that the cigars were ready; they were then delivered to an unidentified person on February 13, 1961, and sent to Cuba".

Approximately at the same time other capsules with botulin toxin were prepared to pour in anything the Commander in Chief might drink in a cafeteria at the Habana Libre hotel. The leader of the support team, after receiving the pills from the CIA Technical Services Division in February 1961, handed them to a Cuban who would introduce them covertly in the island. The highly lethal botulin toxin is obtained from the metabolic process of the bacteria known as Clotridium botulinum. A similar operation was repeated in 1962; this time there was also the intent to act against Che Guevara and Raúl Castro.

In 1962, while these plans were hatched in the United States of America and others were carried out on the island, there was an outbreak of the *Newscastle disease*, a virus attacking the poultry in the provinces of Pinar del Río, La Habana and Matanzas.

The investigation and studies undertaken proved that the virus was introduced through a vaccine used against bird smallpox and manufactured in the Veterinarian Medications Laboratory of Santiago de las Vegas. Also that not all of the doses produced were contaminated, which facilitated the cover-up and the skirting of the quality control applied to such products. This disease had never been reported in Cuba.

At the beginning of 1963, the Special Group W —a CIA section in charge of Cuban covert operations— again as part of its plans to assassinate Fidel, contaminated a diver's suit with a fungus that produced a chronic skin illness known as maduromycosis and

infected the respiratory system with a tuberculosis bacillus. This suit would be given to American lawyer James Donovan who would present it as a gift to Fidel Castro during an interview.

In a U.S. Senate Foreign Relations Committee report, from April 30, 1969, the use of botulinum and viruses as biological weapons is recognized. On May the same year, in another report on chemical and biological weapons by the U.S. Senate special Subcommittee of the National Science Foundation, the low probability of proving a biological action is indicated while its covert use, even in sabotage, is admitted, as well as the difficulties to detect such actions.

In the U.S. Congress' minutes corresponding to the sessions of November 18 through 20, and those from December 2, 9, 18 and 19 that same year, on chemical and biological warfare and international policies, in the Subcommittee on National Security Policy and Scientific Developments of the House of Representatives Foreign Affairs Committee, they admit the use of biological weapons in Korea and Vietnam and debate the development plans of biological warfare against Cuba.

In the first days of May 1971, the Institute of Veterinarian Medicine registered the first cases of an epidemic hitting the pigs in the Havana City area and its surroundings. The diagnosis was an outbreak of African swine fever, an unknown pathology in the country until that moment.

The outbreak was characterized by its high morbidity and fast expansion. This was classified by the specialized international agencies as the most dangerous and disquieting case in the world that year. Consequently, it considerably impaired the production of pork meat for several years, since it became necessary to slaughter close to 400,000 animals. The Cuban scientists research could not find a natural cause that would provide a logical explanation for this outbreak.

Several years later, in the month of January 1977, *The Washington Post* published the confession of a CIA agent who had been involved in the introduction of the African swine fever in Cuba. He said to the press that he had received the biological agent in Fort Gulick, a military base in Panama. He was tasked with the mission of delivering it to a counterrevolutionary terrorist organization through a fishing boat going to the Navassa island —between Ja-

maica and Haiti— from where it was taken in March 1971 to the area of Guantanamo U.S. Naval base for further introduction in Cuba.

In 1971, former FBI agent William W. Turner and journalist Warren Hinckle published the book *Nixon's Tricks*, which is how they called the biological warfare and bioterrorism plans. Here they described how the United States resorted to such actions against Cuba as the introduction of the African swine fever, and the atmospheric modification to produce sudden floods and ruin the crops. This latter task was entrusted to the International Research and Technology Corporation.

On occasions when Cuba has been hit by unusually intensive rains, Cuban scientists have detected high concentrations of silver in the water, that is, in levels that surpass the historical average thus confirming that these downpours have been intentionally provoked by "seeding" the clouds with silver nitrate and iodide, and other substances.

Also in 1971, the United States reported a bird epidemic of *Newcastle* disease. Two years later another significant epidemic of *Newcastle* was reported, again in the U.S. territory, reaching the state of Florida.

Then, in the month of February, despite the absence of exchanges with the United States and the strict sanitary control in our borders given the epidemic in that country and the birds' migratory season, an outbreak of the virus is registered in the province of Villa Clara. Thus, the pathology established itself in the country and expanded to almost the entire territory, except the eastern provinces, which remained free of the disease until 1982.

In the years 1973 and 1974 there was a considerable increase in the cases of *brucellosis* among the livestock in the Camagüey province. Despite health monitoring, treatment and the cattle slaughtered to control the disease, the increase continued; suspiciously, there was no positive reaction to the measures taken. The scientific research done and the investigative work of the state Security Services led to the identification of Alexis Casal Bravo, an expert bacteriologist working at the Veterinarian Diagnosis Labs in Camagüey, as the person who deliberately altered the results of the laboratory tests presenting the positive cases as negatives and vice versa.

The consequences were the loss of a large number of cattle heads, since the healthy animals were slaughtered while the sick animals remained with the heard disseminating the disease. Upon his arrest and interrogation, the corrupt scientist admitted he was a CIA agent doing what he had been instructed to do. The damage caused to cattle breeding would still be felt for years to come.

Then in 1978 two funguses mysteriously appeared in Cuba bringing great damage on two of our main crops: sugarcane and tobacco. The first, associated with the *sugarcane rust*, aggressively attacked the plantations damaging thousands of hectares. Most of the sugarcane strains in our country were vulnerable to that disease, but its dissemination throughout the national territory did not follow the pattern of the wind currents.

Another adversely affected crop was tobacco. The disease known as *blue mold* destroyed almost an entire year's crop. A very suspicious feature pointing to a biological weapon was that it did not respond to the conventionally used pesticides. It was an unknown strain, bearing the characteristics of the so-called supergerms used in biowarfare.

Both, sugarcane and tobacco are major crops that contribute significant amounts of hard currency to the country's economy. Therefore, the damage had a considerable impact on the Cuban economy.

At the end of 1979 and early 1980 another outbreak of African swine fever hit the provinces of Guantanamo and Santiago de Cuba. The source of the infection was found in the proximity of the U.S. Naval Base in Guantanamo. An amazing result came up during the scientific research: two viral stocks, isolated in two dead migratory birds, were identified as the *African swine fever virus*. Later, in two other biological tests inoculating pigs with these viruses, the full episode of the disease could be reproduced; then, the cell damage was confirmed, which is a characteristic of the disease.

Eventually, the conclusion was reached that this specific virus, which attacks pigs, was artificially transformed to be carried by birds. Such scientific result could only be obtained through the intentional use of sophisticated genetic engineering and biotechnology techniques. This shows, beyond any doubt, that the strain of *African swine fever* which circulated in Cuba this time over was artificially manipulated in a laboratory to be used as a bioweapon in a bioterrorist action.

At the end of 1981 and early 1982, the CIA activated two agents it had in Cuba. It wanted to know whether the local press had referred to any disease affecting the birds. The Cuban authorities had news of this action from one of the agents who was actually a "double agent."

In January 1982, the laboratories of the Veterinarian Medicine Institute and the National Poultry Industry diagnosed a severe outbreak of the *Newscastle disease* attacking the birds in Santiago de Cuba and Baracoa. The isolated strains were characterized as extremely aggressive, but their hemoagglutination (HA) titer was also very high, which in nature is only compatible with low virulence strains. This unusual occurrence in nature provides that strain with a considerable viral concentration leading to a faster dissemination; this characteristic could only be artificially produced in a laboratory to be used as a bioweapon in a bioterrorist action. (See the Tables and the statistic analysis in "Annexes...") Until that moment, these provinces had been free of that disease; but they had first been the target of aggressions with the *African swine fever* so the breeding of pigs was banned. As a result of these aggressions the economy of the region was severely impaired, which was exactly their purpose.

Other findings have shown that both areas had reported birds carrying U.S. rings. It has also been confirmed that in 1980 a group of American scientists from the Smithsonian Institute had studied the behavior of the migratory birds in Cuba, specifically in the areas of Santiago de Cuba and Baracoa, where the outbreaks were first reported. Again, this showed the kind of work done during the planning of a bioterrorist action based on the information obtained by scientists.

While the arrangements were underway to receive that delegation of scientists, the Smithsonian raised the possibility of sending an expert in mammals whose objective would be to study the almiqui (*Solenodon cubanus*), but instead a bird expert came who concentrated on the study of migratory birds in the abovementioned areas. The scientific research on migratory birds shows that they migrate to the same place every year, which may prove useful for the introduction of any disease.

In the month of April 1981 various cases of *hemorrhagic dengue fever* were detected and four children died in the neighborhood

of Baluarte, at the Boyeros municipality. The disease was initially concealed by an influenza epidemic and an outbreak of *meningococcal meningitis* affecting the Cuban children at the time. Later, however, the laboratories of the Hygiene and Epidemiology Institute and the Tropical Medicine Institute confirmed the diagnosis of serotype II dengue. This epidemic deliberately introduced in Cuba hit 344,203 people; 116,143 were admitted to hospitals; 10,312 suffered a severe condition, and, eventually, 101 children and 58 adults died.

The economic losses were estimated in 103 million USD; 41 millions were used to provide medical care, 14 millions were lost in production and 43 millions were used to control the Aedes aegypti. (See Tables and "Annexes...")

It was possible to confirm the existence of three epidemiologically unrelated sources of the infection, two in the provinces of Cienfuegos and Camagüey, a few miles to the west of two international air corridors. Generally, in the presence of an epidemic outbreak, a source of the infection is determined and sometimes more than one, usually epidemiologically unrelated. This is only possible when the virus is deliberately introduced in various places simultaneously. (See maps in "Annexes...") On the other hand, their appearance in the proximity of the air corridors is similar to other episodes registered in the country using the aviation to drop the biological agents.

Late in 1981, and when the hemorrhagic dengue was still ravaging the population, an epidemic of *hemorrhagic conjunctivitis* mysteriously erupted and extended all over the island. Despite intensive research it was impossible to unravel the mystery of its sudden appearance.

In 1984 there was an outbreak of *severe dysentery* in Guantanamo causing the death of 18 children and expanding into the province of Santiago de Cuba. The research led to the identification of the bacteria known as *Shigella serotype-1* as the cause of the disease; it had never been reported in the country before then. The study of the epidemiological chain of the disease showed that the first two patients had taken part in a festivity inside the U.S. Naval Base in Guantanamo, where they had eaten and drank beverages. It was after this that they fell ill and then the epidemic disseminated throughout the region.

In 1990, at the beginning of the so-called *Special Period* —a grave economic crisis that hit the country following the demise of the socialist bloc and the tightening of the American economic blockade— Cuba was hit by new biological aggression.

The Cuban government, bent on providing a minimum amount of food to the people, intensified the cultivation of plantain. This vegetable can be a good source of proteins and carbohydrates.

On November 1990, an epidemic of *Black sigatoka*[1] was detected in the plantations of this vegetable in the area of Santa Cruz del Sur, Camagüey province. This is probably the most aggressive and harmful disease affecting this vegetable, but it had never been reported in Cuba before that moment.

The first source of infection of the disease, similar to the *hemorrhagic dengue* and the *Thrips palmi*, was located west of the Maya international air corridor. A second source was found in the north, at a great distance from the first. This one was located in a hollow area surrounded by mountains while in the center part of the island a strip of land was not infected. Shortly afterwards other sources of the infection were found in Sancti Spiritus and Matanzas, while the provinces lying between these and Camagüey were not affected. Again, these areas coincide with international air corridors.

It was the view of the visiting Canadian scientist Robert H. Stover, —one of the most outstanding experts in this disease and director of the Lima Research Institute in Honduras who also worked for many years as an expert with the United Fruit Company— that the appearance of the disease in Cuba was a "very strange" case. Based on his studies, he concluded that the fungus inducing the disease could have been brought to America from Africa by the air currents, but then the islands of Santo Domingo, Haiti and Puerto Rico, which are still free of this disease, would have been hit first.

On the other hand, the only possibility that the disease could have come from Central America would have been as a result of a storm or atmospheric phenomenon, something that did not occurred in the previous months. Besides, in this case, the western provinces would have been affected first. This was scientific proof that it was intentionally introduced through the international air corridors.

[1] This is a fungus that causes great damage to the banana plantations. It is considered by far the most harmful.

For many years foreign specialists have shown a marked interest in studying the presence in our country of a disease known as *citrus 'tristeza' closterovirus*, but this interest grew more intensive between 1993 and 1994. There was an increase in those years of exchanges between Cuban and American scientists on the subject. Likewise, both sides favored undertaking a joint program to fight this disease as well as the vector of the most severe strains of this virus, the aphid known as *Toxopthera citricide*.[2]

Some American scientists commented that several of them had done "field work" at the Guantanamo American Naval Base, in the territory illegally occupied on the island, coinciding with the detection of the aphid in Cuba, precisely in the vicinity of the town of Caimanera, near the Naval Base. At the same time, an insect was detected in Havana City which attacks the citrus groves; this is known as *Black citrus aphid*. This crop —like tobacco, sugarcane and coffee— is an important export item and hard currency earner for Cuba.

By February 1995 a plague known as *coffee berry borer* was identified in the provinces of Granma and Santiago de Cuba; it had been unknown in Cuba until then. Coinciding with the date of appearance, these places had been visited by a group of Americans members of an alleged NGO.

These pests and plagues come up one after the other when the country's economy is most severely battered and the exportable items are most necessary for its survival.

Like in the case of previous plagues, no new varieties, seedlings or plants had been introduced which might suggest a natural outbreak; this, together with other elements point to intentionality.

On November 1995, various sources of infection with the mosquito *Aedes albopictus* —also known as Asian Tiger— were detected in Havana City; its presence had never before been reported in Cuba. This insect is widely spread in Asia and the Pacific Ocean, and it has also been found in South Africa and Nigeria. It was not until 1985 that its presence was reported in the state of Texas, United States, as well as in Brazil, the Dominican Republic and Mexico. This mosquito is a vector of many diseases, one of which is dengue.

[2] An aphid is a vector of the most aggressive strains of the virus known as *citrus 'tristeza' closterovirus*.

The interest of a foreign specialist linked to an international organization and visiting the country at the moment the mosquito was detected became suspicious. This person wanted to know whether this species had been reported in Cuba, and tried to obtain more information about it.

These developments taking place since the victory of the Cuban Revolution have occurred in an unusual, unnatural and suspicious way, but with some common elements:

- Their appearance does not correspond with the common, natural forms of the species or disease;
- In the case of some outbreaks there has been a previous or simultaneous interest by the U.S. intelligence agencies, or the work of American scientists who have visited the island prior to the outbreak has been used;
- A considerable number of these plagues and diseases were detected in the proximity of international air corridors crossing the island or in the vicinity of the Guantanamo Naval Base. The first case clearly suggests the use of aircraft for dissemination;
- In several cases, the strains and plagues detected are resistant to the usual drugs and treatments, and their characteristics do not match those found in wild or common strains which points to the use of supergerms artificially produced and modified for bioweapons.
- Sometimes, the perpetrators have admitted their involvement in these biological aggressions.

Undoubtedly, bioterrorism is one of the most criminal modalities of aggression used against the Cuban people after the revolutionary triumph.

Hemorrhagic dengue

An epidemic was confirmed in April 1981masked by other diseases circulating in the country. It caused the death of 158 people, 101 of them children. It also affected 344,203 people; 10,132 of them developed a serious condition. The healthcare services in the country, scientists from the National Microbiology, Epidemiology and Hygiene Institute (INHEM, by its Spanish acronym), and the Pedro Kourí Tropical Medicine Institute (IPK, by its Spanish acronym) made the precise diagnosis. This was corroborated with reference strains and antibodies from the Atlanta Center for Disease Control (CDC). The disease was identified as dengue serotype 2, in the variant of hemorrhagic dengue with shock syndrome.

WHAT IS DENGUE?

The dengue fever, or 'breakbone' fever, is an acute fever illness characterized by its sudden appearance. Its main symptoms are: a fever lasting usually five days —it seldom lasts seven days— headache, arthralgia (pain in the joints), myalgia (pain in the muscles) and a rash. The latter usually appearing on the third or fourth day after the onset of fever. Additionally, petechiae may become visible on the legs and feet, or in the armpits and palate. During recovery the patient may experience fatigue and depression. The epidemic break out abruptly and in the case of hemorrhagic dengue the mortality rate can be high.

The infectious agent is an arbovirus pertaining to the Group B of arthropod-borne viruses, that is, blood sucking insects such as mosquitoes, acarus, etc. These viruses include four immunologic types: 01, 02, 03 and 04, which also transmit the hemorrhagic dengue.

The pathology is transmitted through the bite of the Aedes aegypti, Aedes ibopictus or Aedes scutellaris mosquitoes previously infected from biting an infected human or primate. The mosquito becomes a carrier from the eighth to the eleventh day following contact with the infected blood and continues to be a carrier for the rest of its thirty to forty-five days of life.

The hemorrhagic dengue is a grave manifestation of the disease which, in addition to the previously described symptoms, is characterized by vascular permeability and an abnormal reaction of the blood clotting mechanisms.

It appears abruptly, with very high fever, reddening of the face and other non-specific body symptoms such as anorexia, vomiting and abdominal pain. Rather often the hemorrhagic episodes include a positive tourniquet test, a tendency to bruising, hemorrhages in the vein-puncture areas, pinpointed petechial eruption and gum[1] hemorrhage, among others. In the most serious cases the gastrointestine hemorrhage can lead to death.

After several days with a temperature, some patients deteriorate abruptly showing signs of circulatory insufficiency such as cold and stained skin, circumoral cyanosis, an accelerated pulse and, in the most serious cases, low blood pressure and low pulse. This set of symptoms is known as the dengue "shock syndrome."

The cause for the development of the hemorrhagic dengue variant with "shock syndrome" has been widely studied. There are two theories:

- The one exposed by American scientist Dr. Halstead stating that the hemorrhagic dengue fever with shock syndrome occurs when the person is infected for a second time with any serotype. The most serious cases occur when the second infection has been induced by dengue serotype 2. As indicated, this was the serotype introdued in Cuba in 1981.
- The second theory, also from an American scientist, Dr. Rosen, states that the hemorrhagic dengue fever with shock syndrome

[1] Relative to gums

occurs due to the circulation of a viral strain made stronger and more virulent by a mutation in its DNA, which provokes a usually fatal reaction.

Outstanding Cuban scientists are of the view that, far from contradicting each other, the two theories tend to converge, as it was the case in Cuba in 1981.

Naturally, these elements make of dengue a most appealing disease to use as part of the biological war arsenal. This has been recognized by U.S. specialists.

DENGUE RESEARCH IN CUBA PRIOR TO 1977

A 1972 study by scientists from the National Hygiene, Epidemiology and Microbiology Institute of Cuba, using about 2500 samples of blood serum taken for a research on polio in the country, was intended to measure the epidemiological situation with regards to dengue, a pathology which was not present in our country.

The study showed that most of the Cuban population had no antibodies for dengue, which corresponded with the epidemiological situation. There was a low level of specific antibodies for that pathology among a group of people older than 30.

Thus, it was concluded that dengue was not circulating in the country. The detected antibodies and the epidemiological background indicated that the latest infection had showed up between 1944 and 1946.

THIRD MEETING OF THE SCIENTIFIC ADVISORY COMMITTEE ON DENGUE AND THE PAN AMERICAN HEALTH ORGANIZATION

The Third Meeting of the Scientific Advisory Committee on Dengue and the Pan American Health Organization (PAHO) was held in May 1974. It was chaired by American scientist Dr. Phillip Russell —a PAHO official— and attended by six American experts, including Dr. Charles Henry Calisher who was also a PAHO consultant.

The Cuban delegation taking part in the meeting presented the results of the previously described research. These were called into question by the members of the U.S. delegation, especially by Dr. Calisher, who suggested that Cuba should make a new survey, this time under advisory from U.S. experts. This proposal was adopted despite opposition by the Cuban mission who did not agree to the advisory although it would accept any assistance in terms of reagents and other means to assess the results.

On July 26, 1974, the PAHO sent to Cuba for revision the draft of the meeting's final report. The Cuban mission responded without objections to the first paragraph of page 9, which read that "[...] A new survey on dengue will be taken in Cuba with assistance from PAHO and the Center for Disease Control (CDC) in Atlanta."

Despite Cuba's initial refusal, Dr.Calisher arrived in Cuba on April 18, 1975 to conduct a new survey on dengue. This gesture was consistent with the country's continued good disposition to cooperate with international organizations.

WHO IS CHARLES CALISHER? SUSPICIONS ABOUT HIS ACTIONS IN CUBA

Dr. Charles Henry Calisher is a Colonel with the Healthcare Services of the United States Armed Forces and one of the most remarkable specialists in the study of arboviruses, that is, hematophagus arthropod-borne viruses transmitted by bloodsucking insects like mosquitoes, acarus, etc., particularly the virus causing dengue.

An outstanding feature in his CV is his works as a microbiologist; four years with the Arbovirus Infection and Arbovirus Isolation Unit; five years as head of the Arbovirus Characterization Section; two years as head of the Arbovirus Branco Reference. After 1973 he worked alternatively in Fort Collins (a Military Scientific Research Center) and the Center for Disease Control (CDC) in Atlanta. He was also a member of the Experts Committee on Dengue at PAHO since 1972. Some of his most significant works and papers include the following:

- Virus transportation by migratory birds; This is a rather interesting topic for biowarfare covert actions.

- Isolation and characterization of the dengue virus in the Caribbean basin;
- Serologic responses to dengue infection in Puerto Rico;
- Identification of the *equine encephalitis of the east* in South America.

During his work in Cuba, the scientists and technicians who worked with him observed certain attitudes incompatible with a scientist involved in such a mission.

For the purpose of conducting serologic studies in Cuba he brought antigens, that is, reference strains of dengue 02 and 03. Inexplicably, the antigen of dengue 03 'did not carry the required titer' and he could 'only' use dengue 02. This was precisely the intentionally introduced serotype that would circulate in Cuba in 1982, the same against which the U.S. Armed Forces have a vaccine to protect its troops allowing it to use it as a biological weapon in war action or bioterrorism. It is known that even if certain vaccines are not commercially available, these are produced at the U.S. military centers to protect their troops from the pathologies they intend to use in biowarfare.

During his stay in Cuba, Calisher could learn that the Cuban people had no antibodies for this serotype. This was very valuable information to decide on the use of this agent in a biological aggression. This dengue serotype had not circulated in the Americas since 1972, according to the PAHO bulletins. (See the Tables provided by PAHO in Annexes...)

While in our country, he tried to open and conduct research with live strains –antigens— of Venezuelan equine encephalitis and yellow fever. These pathologies were not part of the research submitted in his work program. Additionally, they posed a biological hazard since the Hygiene, Epidemiology and Microbiology Institute labs are located at the center of the country's capital without adequate conditions of protection and isolation to perform this kind of research.

As part of his work in Cuba, Dr. Calisher monitored and took field samples in various areas of the country associated with the Aedes aegypti. This gave him information about the high infestation with this mosquito, basically due to our financial limitations

and the consequences of the blockade on the island which jeopardized the purchase of the necessary pesticides. At the end of his work he concluded:

- Consolidate the work previously done by Cuban scientists. Dengue has not circulated in Cuba and only people older than 30 have antibodies for it.

RESURGENCE OF DENGUE IN CUBA AFTER 30 YEARS OF EPIDEMIOLOGICAL SILENCE

In 1977, after 30 years of epidemiological silence, there is an outbreak of dengue serotype 1 in Cuba. The studies done proved that the virus was introduced by a traveler coming from Jamaica, where the pathology was circulating at the moment. The epidemic was quickly restrained by the country's healthcare services and there were no new cases of dengue in Cuba until 1981.

THE UNITED STATES PERSEVERES IN ITS INTEREST ON THE DENGUE SITUATION IN THE COUNTRY

A precondition to implement the biological aggression is to compile the information that would guarantee the success of the operation. This includes the presence of antibodies in the population, the circulation of certain pathologies, the means available to the country to give adequate response and control the situation, the vaccinations carried out and the medications available. These are indispensable data to plan a biological action.

At the end of his work in Cuba, Dr.Calisher continued to show an interest in keeping himself updated about the situation of dengue in our country. He continued to be interested in receiving from the Cuban scientists information about any work related with that disease. To this end, he invited our scientists to publish in specialized American journals, suggesting such topics as new or renovated laboratory techniques; unusual clinical manifestations of dengue; special hemorrhagic episodes; surveys and administrative actions related with dengue, yellow fever and other diseases.

Additional information requested by Calisher referred to the *equine encephalitis of the east and west,* and whether we were inoculating against this disease. He also tried to obtain, regularly, an updated bulletin on the country's epidemiological situation. (See Calisher's letters in Annexes...)

After the outbreak of the epidemic on the island in 1981, he was interested in obtaining the serum of patients, the isolated strains and the reference strains used or the diagnosis made in order to "expand" his research on the outbreak. (See Annexes...)

A report published on September 1980 by the San Juan Laboratories Center for Disease Control, in Puerto Rico, made reference to serologic studies done on Cuban immigrants leaving the island through the Mariel port (See Annexes...) to measure the level of antibodies, mainly for dengue, in an effort to update the epidemiological information on our country with regards to this pathology. Why all that interest on dengue in Cuba?

Shortly before the outbreak of the hemorrhagic dengue epidemic in Cuba, experts from U.S. Army medical services carried out a vaccination campaign with the population stationed at the facilities of Guantanamo Naval base.

UNUSUAL AND SUSPICIOUS DENGUE EPIDEMIC IN CUBA

By April 1981 meningococcal meningitis had taken the lives of close to 200 children in Havana. The Cuban scientists were trying to find a solution to this situation and were bent on producing a vaccine against meningitis type B. On the other hand, an epidemic of influenza had been circulating for several months, as it is the case every year.

Obviously, it was extremely difficult in this context for the country's epidemiological services to determine that a new epidemic was subtly developing. However, the appearance of symptoms incompatible with influenza combined with hemorrhages associated to vascular permeability and the sudden death of two children at the Baluarte community, in the capital municipality of Boyeros, led the Cuban doctors to think that something out of the ordinary was happening. In Cuba, such signals stirred concern among the health authorities

since the country had been facing such phenomena for years, that is, bioterrorist actions originated in the United States of America.

Several groups of specialists in various areas were immediately created to look into the epidemic.

RESULTS AND SIGNIFICANT FINDINGS

The Cuban scientists, using reference strains from the CDC in Atlanta, discovered and established, in just a few hours, that the cause of the "strange underlying epidemic" was the circulation of a virus of dengue serotype 2 in its most dangerous variant: hemorrhagic dengue with shock syndrome.

The diagnosis first proved that the appearance of this new epidemic on the island nation was not the result of a natural infection but possibly the result of its deliberate introduction. The first step taken by the Cuban health services was to request from PAHO and the WHO (World Health Organization) the corresponding reports on the circulation of dengue around the world, especially, dengue serotype 2.

The serotype 2 dengue had not circulated in Southeast Asia since 1963; in India, the South Pacific Ocean and the Fiji Islands since 1975; in the Mediterranean since 1927; in Athens and the ports in the Black Sea, in Africa and Nigeria since 1970; in America since 1977. On the other hand, in the Caribbean basin it had circulated between 1977 and 1978, on islands that had hardly any relation with Cuba. Then, in 1981, at the time of the outbreak in Cuba, the strain circulating in the Caribbean was serotype 4. Therefore, it's clear from the epidemiological point of view that it was not natural that the disease suddenly showed up in Cuba. If serotype 2 dengue was not circulating in the world, how come it showed up in Cuba? Where did this dengue 02 come from?

In his final report on the campaign against the Aedes aegypti in Cuba, run from September 6 through 9, 1981, American scientist Dr. Robert J. Tonn, regional advisor of medical entomology for PAHO, wrote:

"The cause of the hemorrhagic dengue disease is still unknown, despite the suggestion of some advanced theories. The sudden appearance of the disease in Cuba remains a mystery."

STUDIES ON THE EPIDEMIOLOGICAL CHAIN; IDENTIFICATION OF THE FIRST SOURCE OF INFECTION IN THE MUNICIPALITY OF BOYEROS

The Commission set up to investigate the epidemiological chain and determine the first source of infection of the epidemic applied the following procedure:

- Physical check-up of the surveyed patients;
- Clinical analysis of the symptoms showed during the evolution of the disease;
- Study of the patients' clinical records;
- Documental verification of the exact date of the onset of the disease, using the register sheets of the hospitals where the patients were admitted, the clinical records and the clinical follow-up in the case of working patients.
- Securing samples of the surveyed patients' blood serum for serologic and diagnosis tests through the presence of specific antibodies;
- Differential diagnosis and study of concomitant pathological phenomena.

Every patient whose condition was confirmed, and who was among the first infected, were serologically diagnosed and their condition was compatible with dengue, including the cases of hemorrhagic dengue with shock syndrome.

In order to establish the initial sources of the infection, every possibility of a natural infection was first studied and then dismissed. In this connection, every other alternative was looked into. While studying the source of the infection at the Baluarte community it was found that a resident nurse had been ill with dengue and that she worked at the Havana Psychiatric Hospital. Then, the clinical records of the 56 patients in her hospital ward were studied and blood samples were taken from every one of them for serological tests. It was determined that they were all negative; therefore, this could not be the way of transmission.

Taking into account the proximity of the National Zoo, a batch of apes was the subject of serological tests; the results were negative, too. The only person from the community who had taken part in an internationalist mission at the People's Republic of Angola

was located in the area of Alamar, where he had moved. It could be established that he had returned to the country in 1980, long before the onset of the epidemic, and that he had not been ill after that; the serologic analysis was definitely negative to dengue.

Other people who had traveled overseas were also surveyed; none had been ill and their serologic tests were negative. It was, thus, positively determined that this was not the way the virus had entered the country.

A total of 47 persons were studied around that source of infection, and the respective serological samples were taken. It was determined that the first case of this epidemic fell ill on December 20, 1980. Therefore, the first people got infected with dengue at the end of the second week of December that year.

It's worthwhile noting that this community sits a little over a mile from the Jose Martí International Airport.

OTHER INITIAL SOURCES OF INFECTION IN THE PROVINCES OF CIENFUEGOS AND CAMAGÜEY

As mentioned before, the 1981 dengue epidemic coincided with other viruses, so the first cases were mistaken for influenza, a virus circulating at that moment.

Still, Dr. Angel Gollenechea, a Cuban scientist working as a specialist in the Respiratory System Laboratory of the Virology Department at the National Hygiene, Epidemiology and Microbiology Institute, found it quite strange that of the serum collected every year for the serological tests related with the Monitoring Program for that pathology, 87% of the 139 taken this year, which had been negative, came from patients who had suffered from a non-specific virus, then the possibility existed that they had been hit by dengue. Most of them had been sick in the months of December and January, and they lived in the provinces of Cienfuegos and Camagüey. Coincidentally, these provinces reported the highest morbidity rates during the dengue epidemic, second only to Havana City.

Pursuing this line of thought, the most distant cases in time but residing in the towns of Abreu, San Fenando de los Camarones and the very city of Cienfuegos, as well as cases from the towns of

Vertientes, Florida and Camagüey were surveyed. This epidemiological survey showed that they had been hit by a virus in December, when they had symptoms compatible with dengue. They had not been ill again until the survey, and they didn't have dengue in 1977; the blood samples taken for the serological studies registered positive when matched with reference strains of dengue serotype 2, which compared with the previous samples allowed to determine that they had had dengue in December 1980. (See tables, in Annexes...)

The other unusual element that speaks in favor of a deliberate introduction of the disease and which is related with these cases in Cienfuegos and Camagüey is that, according to the epidemiological study performed with a high degree of scientific precision, these two sources of infection and the one in Havana City were not epidemiologically related and could not be considered part of the same chain. It was thus strictly established that these were three different sources of the infection, which does not correspond with a normal epidemic.

The deliberately simultaneous introduction of the dengue virus in one western province, in the central part of the island and in the east was intended for an easy expansion throughout the country affecting all of the population. This analysis is another element indicating that the epidemic did not originate naturally. But a new question came to hunt the researchers involved in the study, How did the infectious virus get to places so distant one from the other? And, how could this have been done directly but independently?

A hypothesis came up that had already been raised before when plagues and diseases appeared in the country suddenly and suspiciously, obviously related to bioterrorist actions. Most of these had been detected in the vicinity of the Guantanamo Naval Base or the adjacent territory, or under the international air corridors crossing the island from north to south. The sources of the infection in Cienfuegos, as in Camagüey, were approximately at the same distance west of the Girón and Maya international air corridors. This indicated, once again, that the infectious agent could have been dropped from one of the many U.S. planes flying over the island on any given day. (See maps in Annexes...)

Hardly a decade had passed before this hypothesis has proven, when an experienced pilot from the Cubana Airline became an

eyewitness as a plane registered in the United States and using the Giron corridor discharged an unknown substance over the Cuban territory.

Again, the Cuban veterinarian and plant sanitation services, and healthcare services were alerted. These immediately started combing the areas under the corridor looking for anything unusual. They would not have to wait long before detecting east of Havana province and west of Matanzas a new plague, previously unreported in the country. It was the Thrips palmi, which affects various crops including potato, a staple food for the Cuban people.

ADDITIONAL ELEMENTS SUPPORTING THE HYPOTHESIS ON THE USE OF THE AIR CORRIDORS FOR BIOTERRORISM

The international air corridors are pre-established airways determined by radio navigation equipment enabling the rigorously controlled and organized international air traffic. Every state takes responsibility for air traffic control on its territory. On the other hand, according to certain rules and regulations set forth by the International Civil Aviation Organization it must allow the over flight of other states' aircraft.

At the time of the dengue epidemic in Cuba, the two abovementioned air corridors already existed crossing the island from north to south through the provinces of Matanzas and Camagüey. At the moment, from 30 to 50 aircrafts used the Girón corridor on a daily basis and from 60 to 70 used the Maya corridor, including the planes coming from or heading to the United States. The minimum flying altitudes move between 10,000 and 20,000 feet while the maximum go from 37,000 to 39,000 feet. In the case of small aircrafts, the flying altitude goes from 5,000 to 7,000 feet.

Several books written by specialists on the issue of biowarfare and bioterrorism offer descriptions of experiments and research in a science called aerobiology. This deals with various ways and methods to disseminate biological agents with the use of the aviation. Reinforcing the criteria on the advantages of the use of biowarfare and bioterrorism, a U.S. Army Division General said

in 1946: "Let's imagine the spreading of infectious material from aircrafts on a certain population, without previous warning (...) Any country could be completely paralyzed or destroyed at will by such a campaign..."

In his book "Peace or Pest" published in 1949 Dr. Theodore Rosebury, who had been chief of the Air Dissemination of Infection Bureau in the Biological War Experimental Center at Fort Detrick, wrote: "This Center had never ceased working after World War I (...) the dissemination of infectious germs by plane leading to the contamination of insects is most valuable..."

Another sinister American character involved in the biological and chemical warfare was George W. Merck, chairman and CEO of the Merck Company, one of the world's most powerful industrial consortia producers of chemical products in the 1950s. This special advisor to the U.S. War Secretary and director of the Biowarfare Committee argued that: "As part of the experiments, valuable observations had been made on the properties and behavior of the air loaded with disease-carrying germs (...) This work included the improvement of the exact methods for producing and measuring the clouds of microorganisms to determine their potential and to study the elements influencing the movement of the air loaded with pathogens..."

Meanwhile, among the subjects researched at various U.S. universities which include work related to biowarfare and terrorism, special attention is paid to the dissemination of pathogens and plagues by the aviation.

Plenty of examples can be found in the papers published by American institutions such as:

- University of California; Naval Biological Laboratory; its main research area is aerobiology and the performance of germs disseminated from planes.
- University of California at Berkerly; its research on microbiology and aerobiology has included the study of ways to spread the bubonic pest, coccidiomycosis and meningitis.
- Illinois Institute of Technology; IIT Research Institute; its main contribution has been in the field of chemical and biological warfare. It became the major research center in aerobiology.

In addition to these centers, there is news of other experiments done by the U.S. Armed Forces to test the effectiveness of dropping

from planes insects capable of causing epidemics. It has been known that the Bioweapons Center of the U.S. Ground Forces made tests with the Aedes aegypti mosquito in an area in Florida dropping from a plane a swarm of 600,000 of these insects. Later, an entomologic survey was made aimed at corroborating the distance traveled by the insects and the number of people bitten, to determine the potential of transmission at great distances when aviation is used to spread the biological agents.

These examples clearly show how the United States of America uses this ways and means in bioterrorist actions with pathogens. The hypothesis is thus proven about the possible way of introduction of the dengue epidemic in Cuba.

And if these elements did not suffice, there is still the story of the devilish Yankee bioterrorist experiments and their relationship with the dengue epidemic in Cuba in 1981.

PAKISTANI LABORATORY; WHO WORKED WITH THE MOSQUITOES?

In the article entitled "The death incubator", published by Iona Andronov in 1982 in a Soviet magazine she denounces that according to accusations from Abdul Aziz Danishyar, director of the *Kabul New Times*, CIA-recruited American biologists, under the pretext of fighting malaria, have bred in the city of Lahore in Pakistan a particularly virulent type of mosquito that infects its victims with a lethal virus.

Likewise, Pakistani journalists of the weekly magazine *Viewpoint*, informed the author of the aforementioned article of the activities there of microbiologists of the University of Maryland. These worked, following CIA instructions, at a laboratory in Lahore known as Pakistani Medical Research Center (PMRC).

According to these journalists, a year before tens of people from Lahore living in the vicinity of the PMRC had been attacked by swarms of a type of mosquito unknown in the region before then. The people bitten by these mosquitoes fell ill with yellow fever, hepatitis, jaundice or they simply went mad. The doctors in Lahore could establish that the promoter of this unexpected calamity had been the Aedes aegypti mosquito. Those affected could not be saved by

any antidote or medication. It would later be revealed that the PMRC had reproduced the insects.

In an effort to justify their actions, 'the U.S. masters at the PMRC' opened up a medical post in the outskirts of the city 'to treat' those affected, who were inoculated there with a strange substance. The result was that eleven of these people completely lost their minds.

Later on, in view of the avalanche of denunciations and the resulting hostility, the director of the PMRC strictly prohibited that his personnel communicated with anyone outside the institution, responded to telephone calls or allowed foreigners into the facility.

The same source has reported that before the dengue aggression on Cuba, the laboratory in Lahore had received instructions from the United States to secure the production of contaminated mosquitoes for the CIA subversive actions against Cuba.

An official with the PMRC, Dr. Nalin, said to a reporter from the *Literaturnaya Gazeta* the following: "Our task consists in obtaining new super-mosquitoes. To that end we practice crossbreeding, we subject them to radiation and we apply the advances of genetic engineering (...) Our super-mosquitoes are called to suppress the centers that disseminate malaria. Ours will be stronger, fertile and lively."

NOTORIOUS TERRORIST OF CUBAN DESCENT ADMITS HIS INVOLVEMENT IN THIS BIOTERRORIST ACTION

On September 11, 1984, the American press published very illustrative news on the introduction of dengue in Cuba in 1980.

The notorious terrorist and counterrevolutionary of Cuban descent Eduardo Arocena, leader of the terrorist group Omega-7 linked to the U.S. Central Intelligence Agency, was charged with the 1980 murder of Cuban diplomat Felix Garcia Rodriguez, one of Cuba's UN representatives, and with participation in a number of bomb blasts in America. In his court statement, before the New York Federal Court, he said that: "My group's mission was to receive certain

germs to introduce them in Cuba (...) to start the so-called chemical war." (New York City Federal Court, p.2189, 1984, file 2 FBI NY 185 – 1009).

Later on, referring to the same mission, he added: "As part of this mission, there was another boat moving ahead of mine which would be carrying out a mission inside the Cuban territory, as I have already said."

As proven in the course of the investigation and the research by Cuban scientists, the dengue virus was introduced in Cuba in December 1980.

CONSEQUENCES OF THE AGGRESSION

As recognized by the Pan American Health Organization and the World Health Organization, the hemorrhagic dengue epidemic in Cuba, in 1981, had no precedent in the history of this disease. It was also the most serious and significant case recorded in the world, with a total number of 344,203 people affected; 10,312 of them developed a serious conditions; 116,143 were hospitalized in three months, 24,000 of them with hemorrhages; 158 died, of which 101 were children. The epidemic registered the record figure of 11,400 new cases in one day, on June 6, 1981.

The resulting economic losses were estimated in 103 million US dollars; 41 millions in medical care, 5 millions lost in salaries, 14 millions lost in production, and 43 millions spent to control the mosquito.

In the course of the epidemic, the United States blockaded every action taken by Cuba to purchase pesticides, larvicides and other necessary inputs to fight it. Many resources had to be brought by plane from places as distant as Japan and Europe, at a cost of 5,000 US dollars a ton, that is, three and a half times the cost of the product.

The Cuban government made great efforts to put an end to the epidemic. It became necessary to even turn schools into makeshift hospitals in order to provide special care to the patients with the most serious condition and definitely cut the epidemiological chain by isolating the patients.

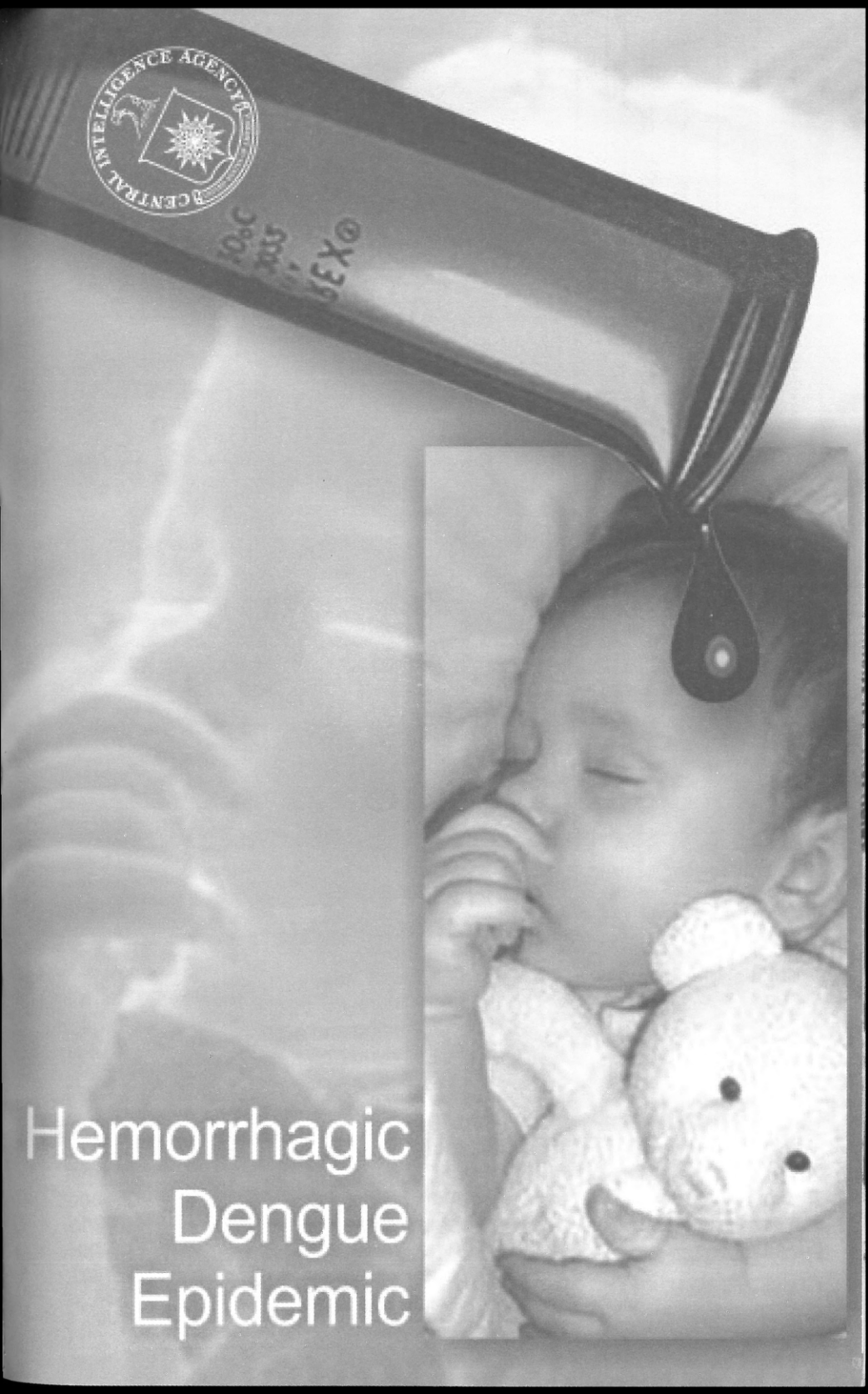
The last new case was reported on October 10th the same year. Thus the most significant bioterrorist action carried out on our country by the United States of America had been finally defeated.

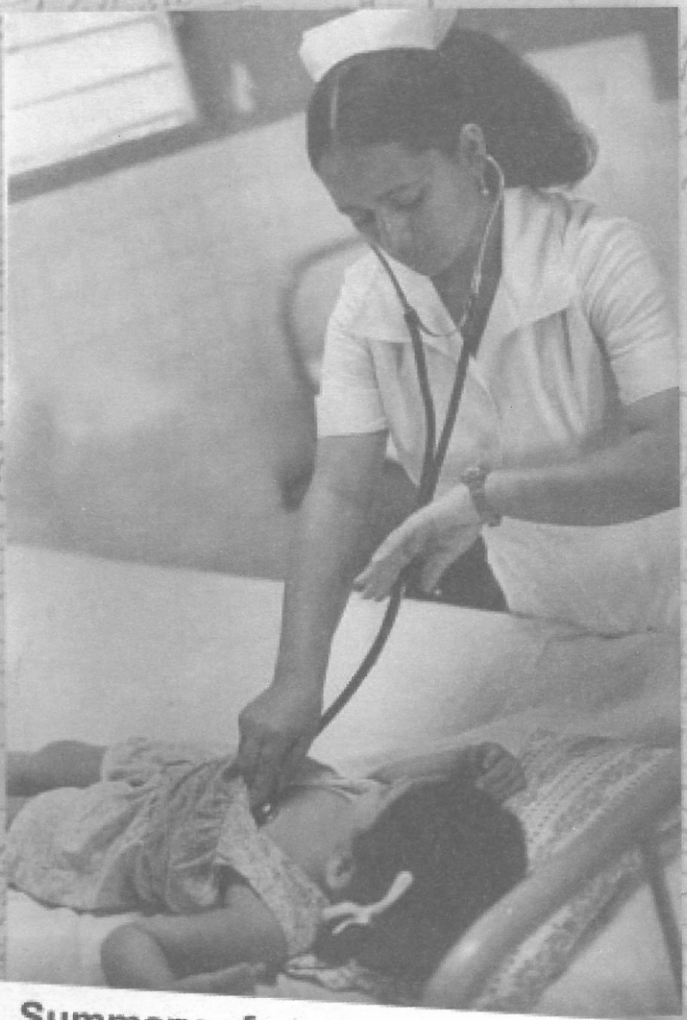
In an article published in 1982 by the *Covert Action* magazine it is recognized that the 1981 dengue epidemic in Cuba was in fact a U.S. aggression. And if the information obtained from the PAHO bulletins was not enough to prove that the serotype 2 strain that affected Cuba was not circulating in the world at the moment, there is still the conclusive scientific evidence presented by the Cuban scientists in 1995.

That year, a group of scientists from the Pedro Kourí Tropical Medicine Institute conducted a genome study of the dengue virus strain which had circulated in 1981. This is like comparing the "fingerprints" of the virus and its relationship with others. The study and comparison of the nucleotides in the DNA of the strain proved that it was similar to no other that had circulated in the Americas or the world, and that it only matched those that had circulated 40 or 50 years before.

The American scientists tried to call into question these results saying that the study could only be validated if done with strains isolated from patients.

So, again in 1996 and 1997 our scientists performed the studies but this time they used genetic material obtained from the pathological histology cuts of the autopsies of patients dead during the epidemic. As expected, identical results were obtained. The virus strain that affected Cuba in 1981 was not circulating in the world at the time of the epidemic.

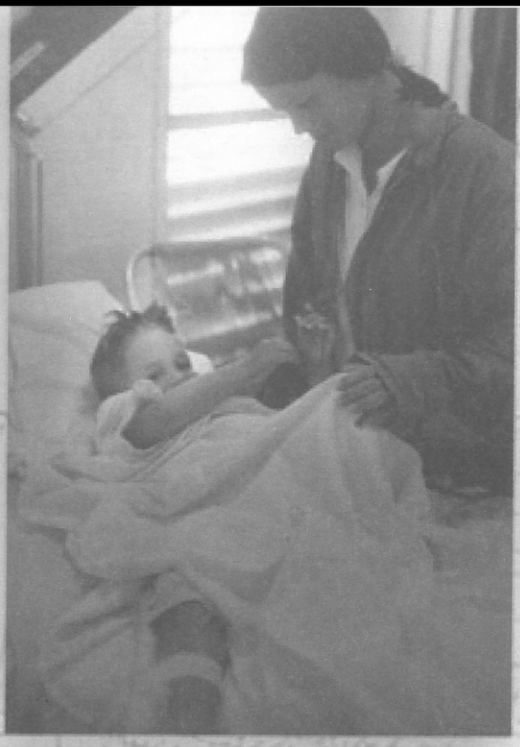

CENTRAL INTELLIGENCE AGENCY
Hemorrhagic
Dengue
Epidemic



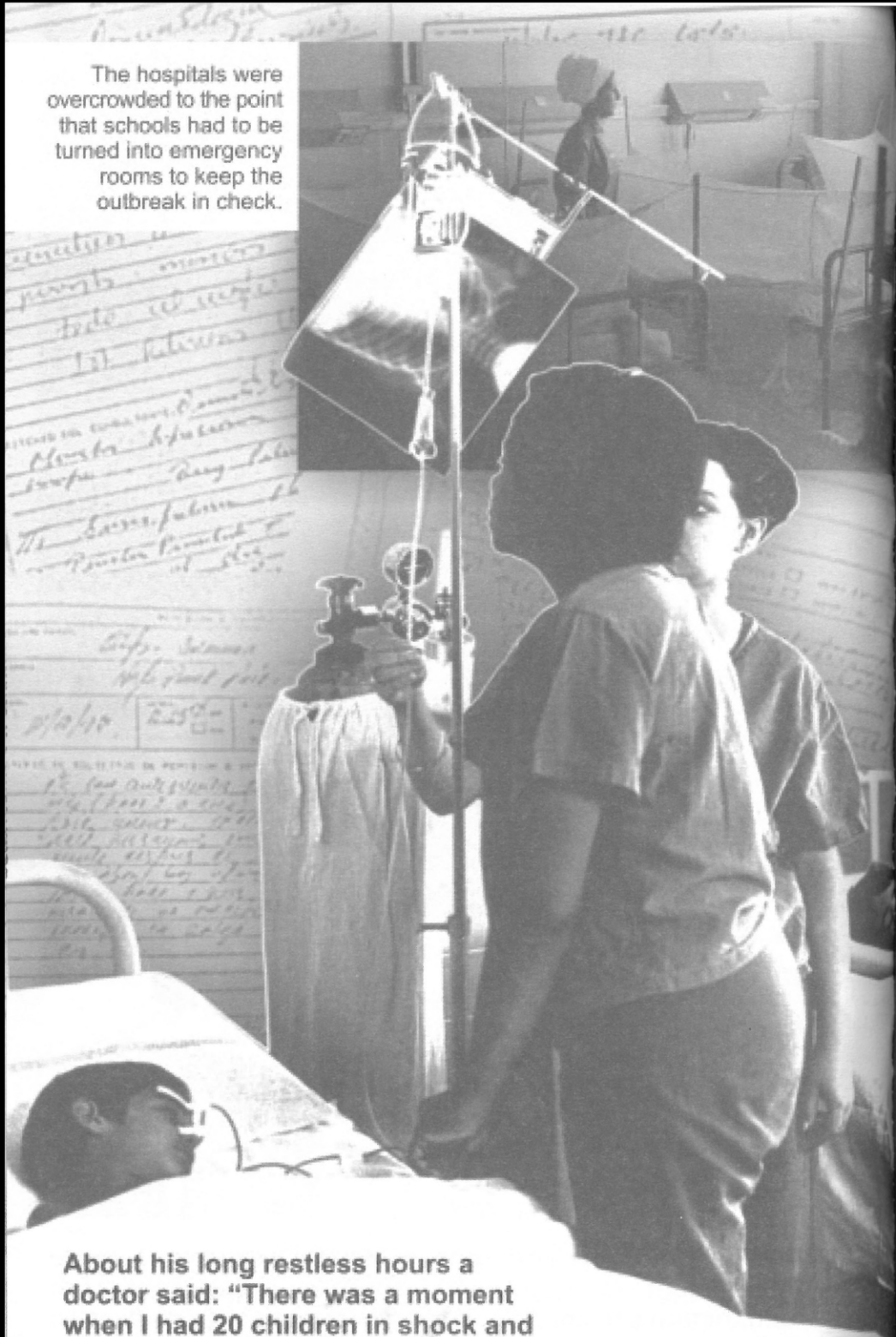
Summary of atypical medical history

"A five-year-old female patient, previously healthy and showing a good nutritional condition, has had a temperature for three days combined with headaches and 'body pain', as well as vomiting and a discreet abdominal pain. On admission day she shows red color lesions on the torso and extremities which the family describes as 'blood stains.'

"The physical examination confirms petechia on the torso and extremities as well as a schimosis on the right leg. The patient is perfectly conscious. The temperature is 38 degrees Centigrade; blood pressure 90/60; heart beat 120/minute; respiratory frequency 28/minute; normal respiratory and cardiovascular system; swollen abdomen, slightly painful at the right epigastria and hypochondrium. The liver is over 1 cm at the side. Spleen swelling is not observed. Lab results: low blood platelet count (thrombocytopenia) 80,000/mm^3; leucogram, normal for her age; hemoglobin, 12g%; hematocrit, 34."

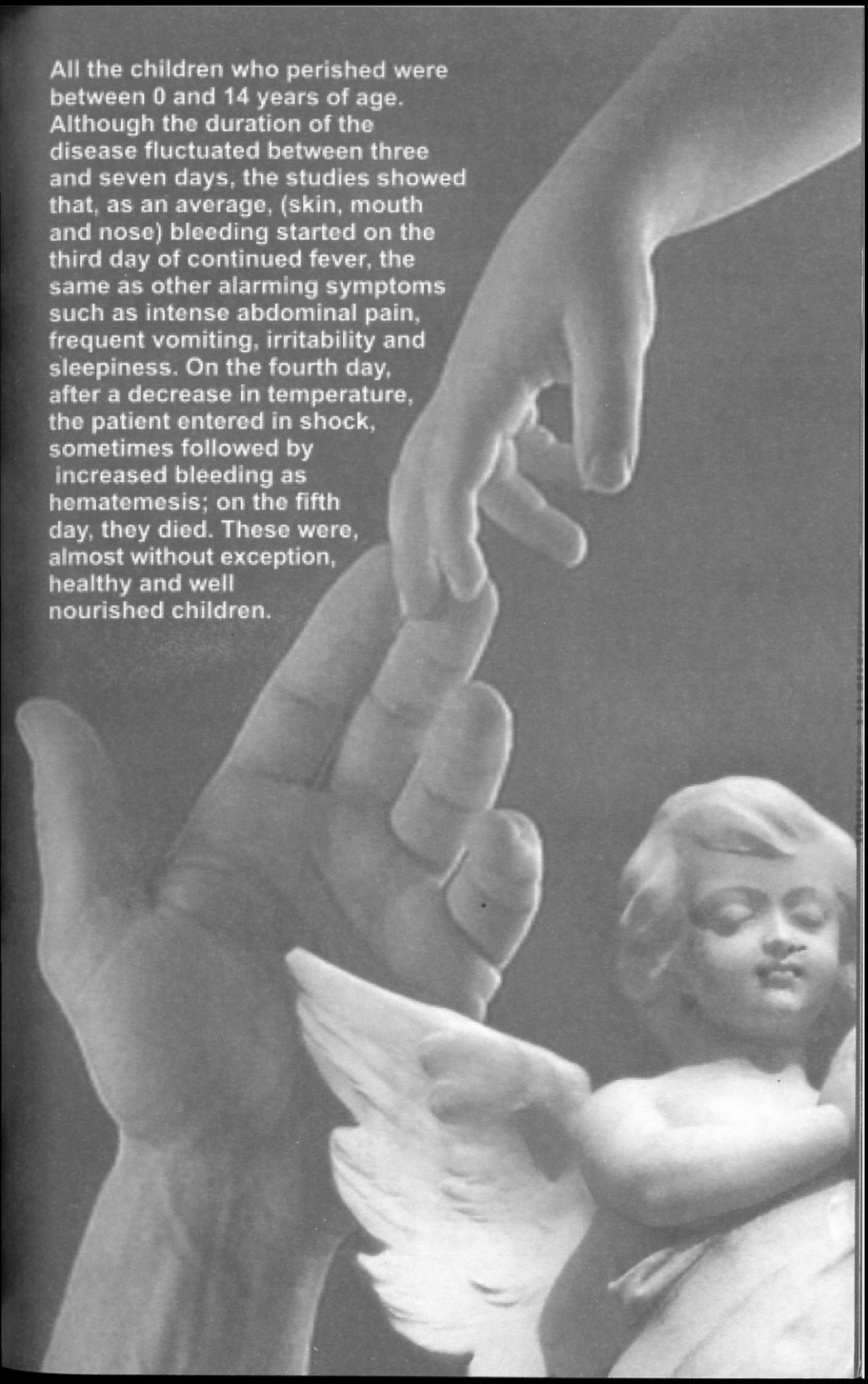


Both, medical and paramedical personnel were insufficient to cope with such a catastrophe, but exhaustion and limitations were overcome with dedication and human solidarity to save the children's lives.



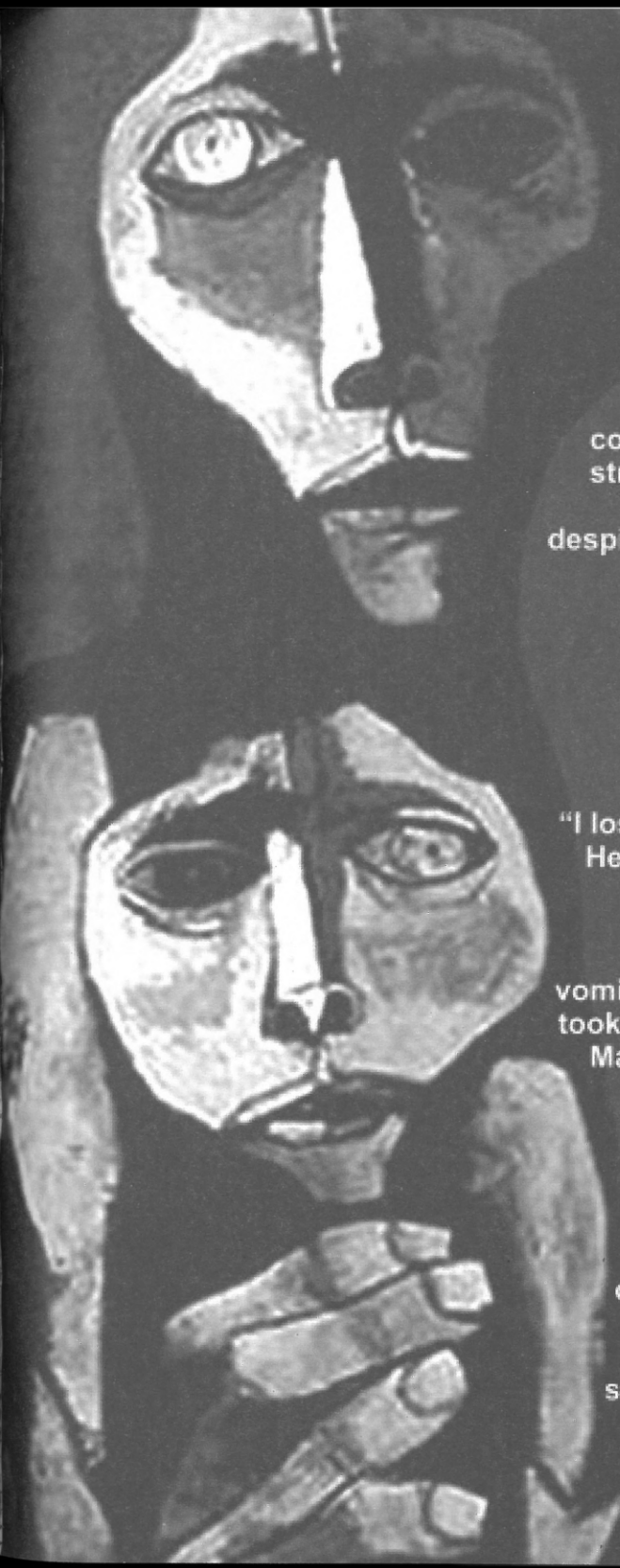
The hospitals were overcrowded to the point that schools had to be turned into emergency rooms to keep the outbreak in check.

About his long restless hours a doctor said: "There was a moment when I had 20 children in shock and vomiting blood."



All the children who perished were between 0 and 14 years of age. Although the duration of the disease fluctuated between three and seven days, the studies showed that, as an average, (skin, mouth and nose) bleeding started on the third day of continued fever, the same as other alarming symptoms such as intense abdominal pain, frequent vomiting, irritability and sleepiness. On the fourth day, after a decrease in temperature, the patient entered in shock, sometimes followed by increased bleeding as hematemesis; on the fifth day, they died. These were, almost without exception, healthy and well nourished children.

101 OF THE 158 LETHAL VICTIMS WERE BETWEEN THE AGES OF 0 AND 14.



"She spent that night with treatment and the following day she vomited her breakfast milk with blood [...] She was hospitalized on July 4th and died on the 13th, in the evening; she had been in a very critical condition [...] She was a strong and healthy child but she did not react despite everything they did to save her [...]."

Isnayda Marrero Castillo, mother of Cintia Mesa Marrero, a 3 year old girl.

"I lost a grandson in 1981. He was born in 1976 [...] he felt ill and we took him to the policlinic. Later, at home, he vomited twice [...] then we took him to the hospital in Matanzas. He died there at dawn [...]. He was certified as having suffered sudden hemorrhage. He died on the 9th; it was his birthday [...] we couldn't sleep thinking of his coming birthday. He died so suddenly, in seconds."

Dagoberto Ramos, grandfather of Eliecer Aguilar Ramos, a 5 year old boy

"Upon returning from the airport she vomited breakfast, and sometime later she told me 'I'm falling down!' [...]. At 10, on the night of that same day, she was dizzy again and we went back to the hospital [...] they decided to hospitalize her [...]. At midnight I asked her to sleep and she said no because she was going to die [...]. Before closing her eyes she gave me a very cold kiss and asked me to hold her hand [...]. About 2 in the morning I felt her hand letting mine go. She was growing purple [...]. That was it [...]. Due to that, her father died six months later, it broke his heart [...]"

Silvia Torres, mother of Ernestina Oñate, a 12 year old girl

"The girl told me about noon that day: 'Mommy, I think I will not live longer, I'm going to die [...].' About 2 in the morning of the 19th she was very nervous, and on the 20th she was taken to intensive care [...]. At 7 in the evening a cousin got the report that she has passed away."

Zenaida J.Isla Romero, mother of 5 year old Yamile Villalonga

"She was a Down syndrome, but she was a healthy child [...]. On June 20th she had a temperature and I took her to the policlinic [...] the pediatrician told me to bring a sample of her feces and urine to the lab, but before that she fainted and I cried to the nurse: 'Nurse, my child is dying [...]' She passed away on June 21, 1981."

Inocencia M. Ledon Hernandez, mother of Mailin Castaneda Ledon

"I lost a 13 year old girl and part of my life with her [...] she said to me: 'Mommy, I'm going to die, yes, I'm going to die [...].' She died within a week [...]. I am 64 years old and I still work because I cannot stay home, it's as if she was there by me all the time."

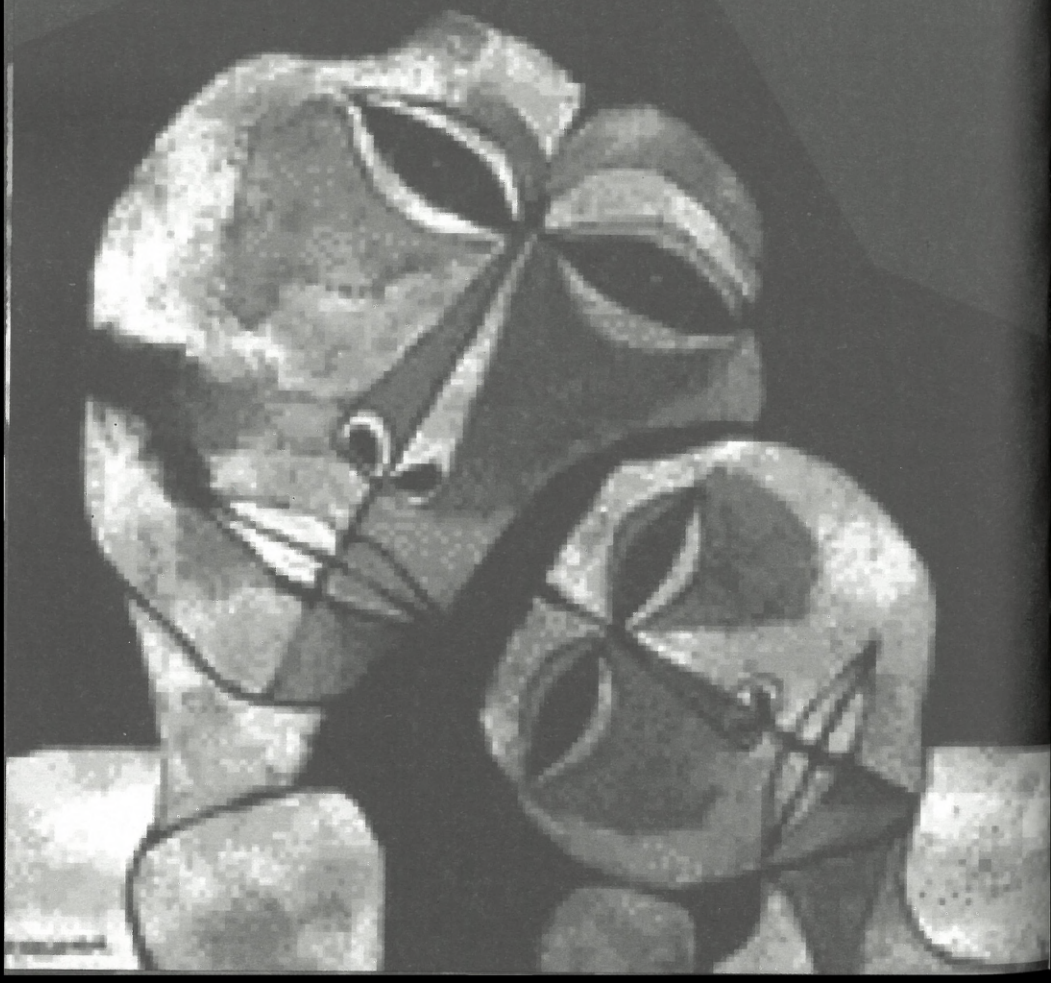
Casimira Camejo, mother of Nereida Carmona Camejo

"I was with her on the 13th when she passed away [...] I carry this pain in me [...] everything possible was done for her until the end; they even used Interferon which was received in the last days [...]."

Felix Mesa, father of 3 years old Cintia Mesa Marrero

"Saini Herrrera Suarez, 5 years old, came from Guantanamo to spend her vacations at my house [...] At 10 in the morning on the 14th she was taken to the hospital [...]. She was hospitalized and that same night she entered in shock [...] I was working in the next room and they said to me: 'There is a girl who is very grave now [...].' I did not think it could be my niece because I didn't think she was so seriously ill. But she was taken to intensive care and there she entered in shock. The doctors and all of the personnel were with her; she died on July 16th at 6 in the morning [...]. It was my brother's only girl, and he was devastated [...] he disappeared from the hospital, and then he fell on the floor and had to be given an injection. The following day, still very upset, he went to pick up the girl's things; he burned everything and burned his hands. He had to be taken to the psychiatrist and he's still sick, [...] the mother could never work after that. They are still devastated for the death of their girl."

Mauria Herrera, the girl's aunt



"On July 7, 1981, I took my little boy to the pediatrician; he looked somewhat feeble and the doctor said to watch him closely. He got worse and I went back to the doctor. He had a set of lab tests made and at the end they said he was well [...] the following day at 5 in the afternoon someone said to me that the boy's color did not look normal. I took him to the hospital again and he was taken straight to intensive care. I never saw him alive again."

Rosa M. Acuña, mother of 10 years old Carlos A. Rodriguez Acuña

The best specialists were there, battling death and responding the imperialist terrorists by saving as many lives as they possibly could.

"WE HAVE SUCCESS FULLY TACKLD THE EPIDEMICS: SWINE FEVER, SUGARCANE RUST, BLUE MOLD, AND WE HAVE ERADICATED THEM! NOW WE'RE FACING THE HEMORRHAGIC DENGUE, AND WE SHALL ERADICATE IT!

FIDEL on July 26, 1981, in Las Tunas

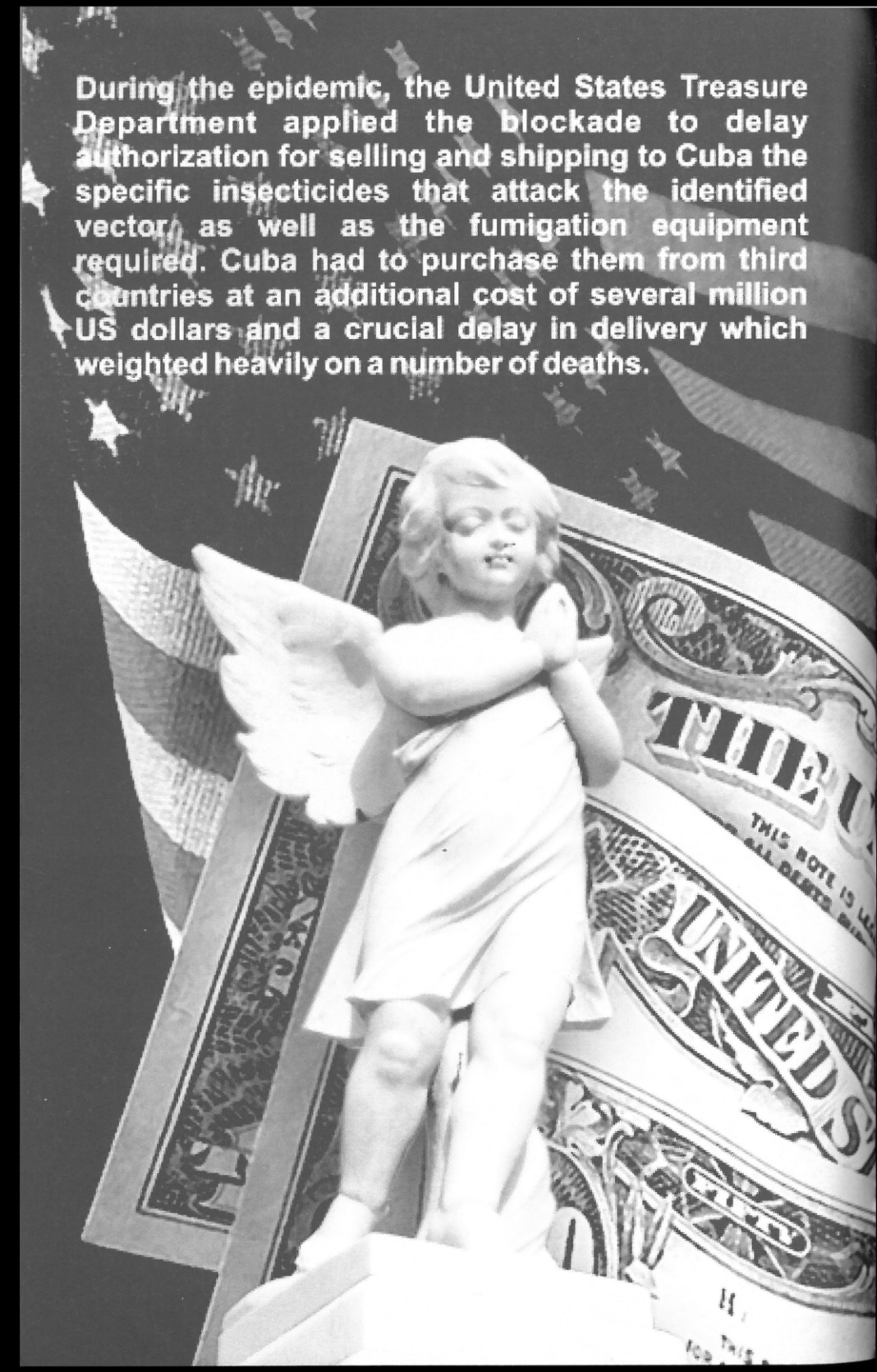
The Dengue aggression was denounced by the Commander in Chief on July 26th, in Las Tunas.

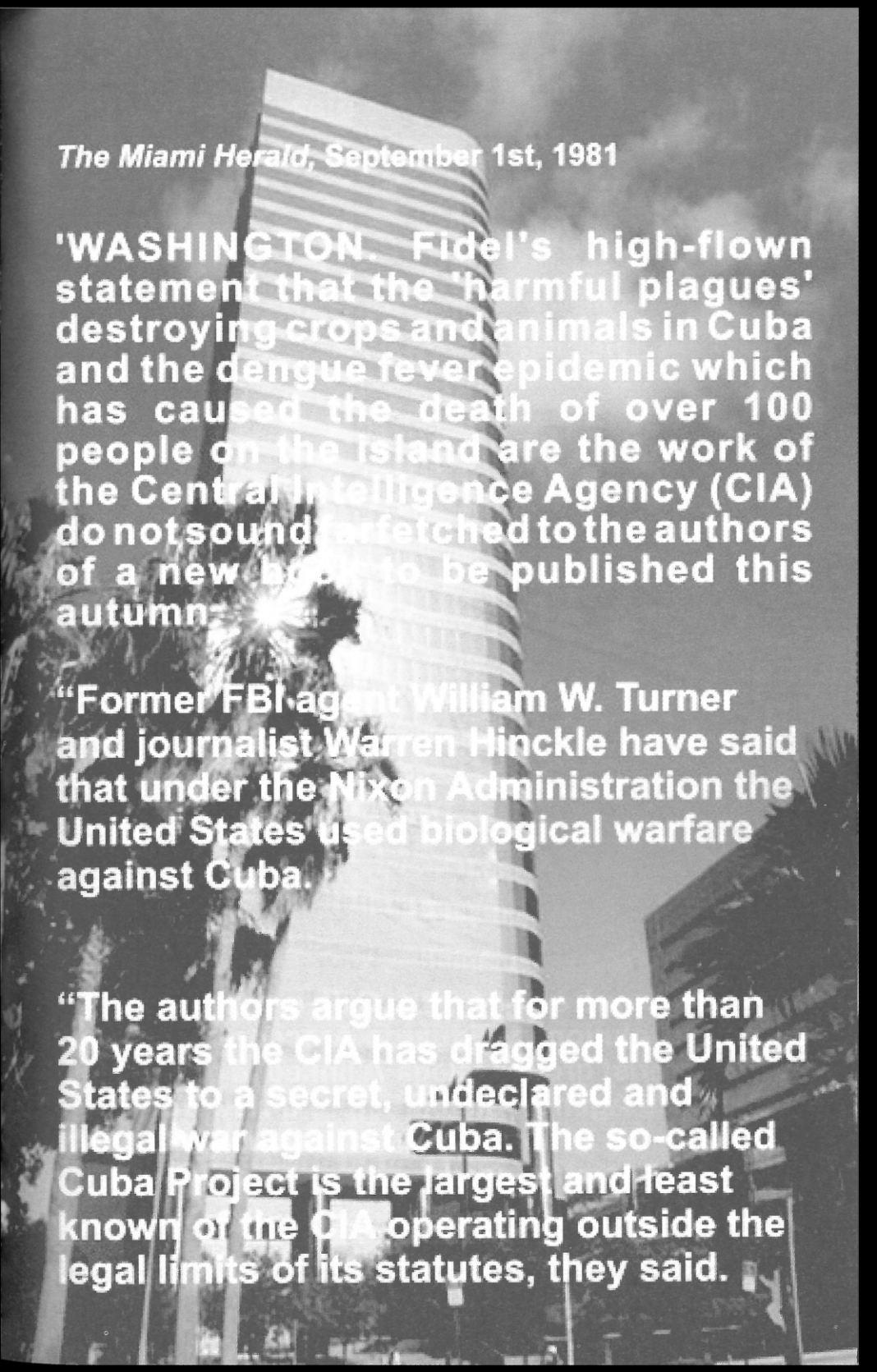
The serologic diagnosis
was quickly made at the National Institute
of Hygiene, Epidemiology
and Microbiology, and the
Pedro Kouri
Tropical Medicine Institute of Cuba using
reference strains from
the Atlanta Center for Disease Control.

DENGUE 02

had never circulated on the island.

During the epidemic, the United States Treasure Department applied the blockade to delay authorization for selling and shipping to Cuba the specific insecticides that attack the identified vector, as well as the fumigation equipment required. Cuba had to purchase them from third countries at an additional cost of several million US dollars and a crucial delay in delivery which weighted heavily on a number of deaths.





The Miami Herald, September 1st, 1981

'WASHINGTON. Fidel's high-flown statement that the 'harmful plagues' destroying crops and animals in Cuba and the dengue fever epidemic which has caused the death of over 100 people on the island are the work of the Central Intelligence Agency (CIA) do not sound [illegible] far-fetched to the authors of a new book to be published this autumn.

"Former FBI agent William W. Turner and journalist Warren Hinckle have said that under the Nixon Administration the United States used biological warfare against Cuba.

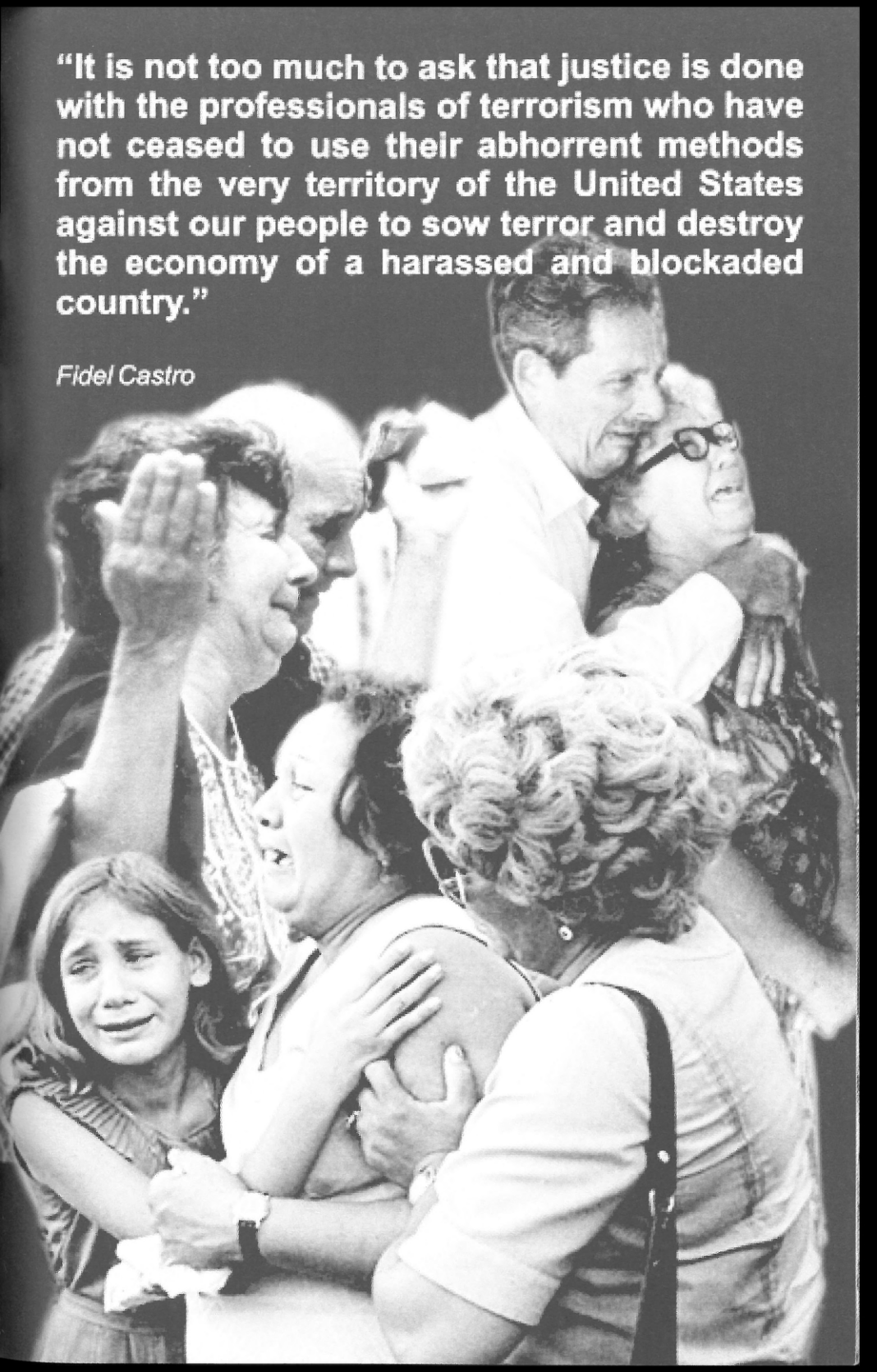
"The authors argue that for more than 20 years the CIA has dragged the United States to a secret, undeclared and illegal war against Cuba. The so-called Cuba Project is the largest and least known of the CIA operating outside the legal limits of its statutes, they said.

"The mission of the group I headed was to obtain certain germs and introduce them in Cuba

Statement by Cuban American terrorist Eduardo Arocena to the Federal Court in New York City, p.2189, 1984. File 2FBINY 185-1009.

On September 1984, Cuban American counterrevolutionary Eduardo Arocena, ringleader of the terrorist group Omega 7, linked to the Central Intelligence Agency, stated before a New York City court that his group had taken part in the covert operation that introduced dengue in Cuba in 1981.

Despite this confession, terrorist Arocena was not tried and the U.S. authorities did not carry out any investigation.


"It is not too much to ask that justice is done with the professionals of terrorism who have not ceased to use their abhorrent methods from the very territory of the United States against our people to sow terror and destroy the economy of a harassed and blockaded country."
Fidel Castro

1. Aldaris Reyes Estrada
2. Alejandro Acevedo Martínez
3. Alaín Véliz Barreto
4. Alexander Céspedes Ponseca
5. Alexis Barzaga Barzaga
6. Alexis García Rodríguez
7. Alfredo Sánchez Villalobo
8. Aman Núñez Matos
9. Amarilis Valle Posada
10. Ana Milagros Gómez Parra
11. Anarais Machado Fleitas
12. Andrés Cobas Castro
13. Ángel M. Medina Vicario
14. Annia Dolores Pagán Padilla
15. Aramis López Cárdenas
16. Arquímides Delgado Zamora
17. Aslilie Monzón Rodríguez
18. Bárbaro Hernández García
19. Carlos Rodríguez Acuña
20. Carmen Ceballos Prieto
21. César Medrano Bello
22. Cintia Mesa Marrero
23. Danelys Núñez Pérez
24. Daniel Gutiérrez Balloga
25. Diorquis Salazar Betancourt
26. Eduardo Benítez Téllez
27. Elena Rodríguez López
28. Elieser Aguilar Ramos
29. Elison Herrera Carcore
30. Emiliana Bonet González
31. Emilio García Leonor
32. Eneida Ros Lodoy
33. Enrique Toledo Hernández
34. Ernestina Oñate Torres
35. Henri Estrada Martínez
36. Idalmis Rodríguez Cedeño
37. Inés Pérez Arruego
38. Ismael Velázquez Cena
39. Yoel Barnet Pérez
40. Jorge Luis Bocourt Brindis
41. José Alemán Henández
42. José Antonio Araña Guerrero
43. José Lázaro González Varona
44. Leosmar Riquems Rivera
45. Lázaro Bacallao del Llano
46. Lissete Bolaños Suárez
47. Luis Rojas Speek
48. Maricela Cruz Cruz
49. Marilin González Yack
50. Danys Gutiérrez Hernández

51.Marilyn Velásquez Fonseca
52.Diarelis Santos Hernández
53.Martha Camacho Moy
54.Maylín Castañeda Ledón
55.Miguel de Jesús Osorio Canalero
56.Miguel Machado Ortega
57.Milvia Cin Vázquez
58.Mirelis Avello Carmenate
59.Mónica Caballero Tozanda
60.Nereida Carmona Camejo
61.Niurka Colás Quintana
62.Noemis Lamelos Mirales
63.Noemí Prieto Alonso
64.Octavio Borges Aguilera
65.Orlando González Gárgara
66.Osmany Gómez Ortega
67.Ovis Velázquez García
68.Pedro García González
69.Rafael Cardín Leyva
70.Raudel Rojas Rondón
71.Raúl Mustelier Fuentes
72.Rosa Carrazana Archel
73.Ruslán Mora Sánchez
74.Mario Fernández Fernández
75.Saine Herrera Suárez
76.Salvador Rafael González Batista
77.Silvia Olivera Nápoles
78.Tony Fernádez Mayor
79.Walquis Romero Mesa
80.Yaima Cabrera Figueredo
81.Yaima Rodríguez Ferro
82.Yaima Covadonga Hernández Guerra
83.Yamilé Cacique Coos
84.Yamilé Villalonga Isla
85.Yamilé Cobar Rodríguez
86.Yanet García Hernández
87.Yannete Chacón Caminero
88.Yannete Mendoza Burgos
89.Yaquelín Sosa Rey
90.Yasser Grulla Hidalgo
91.Yasmila Rodríguez Martínez
92.Yenesi Monzón González
93.Yoel Perdomo Cabrera
94.Yolanda Miralles Bodi
95.Yosvani Rodríguez Escalona
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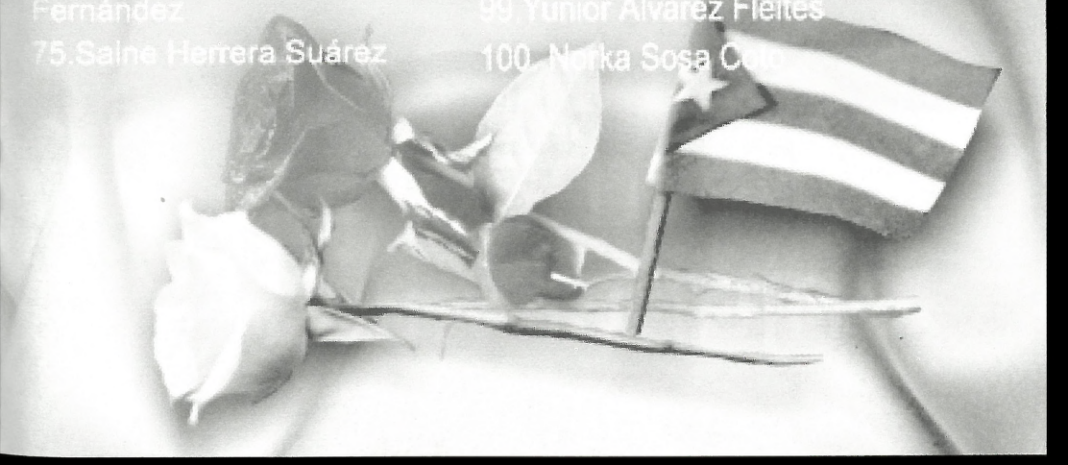
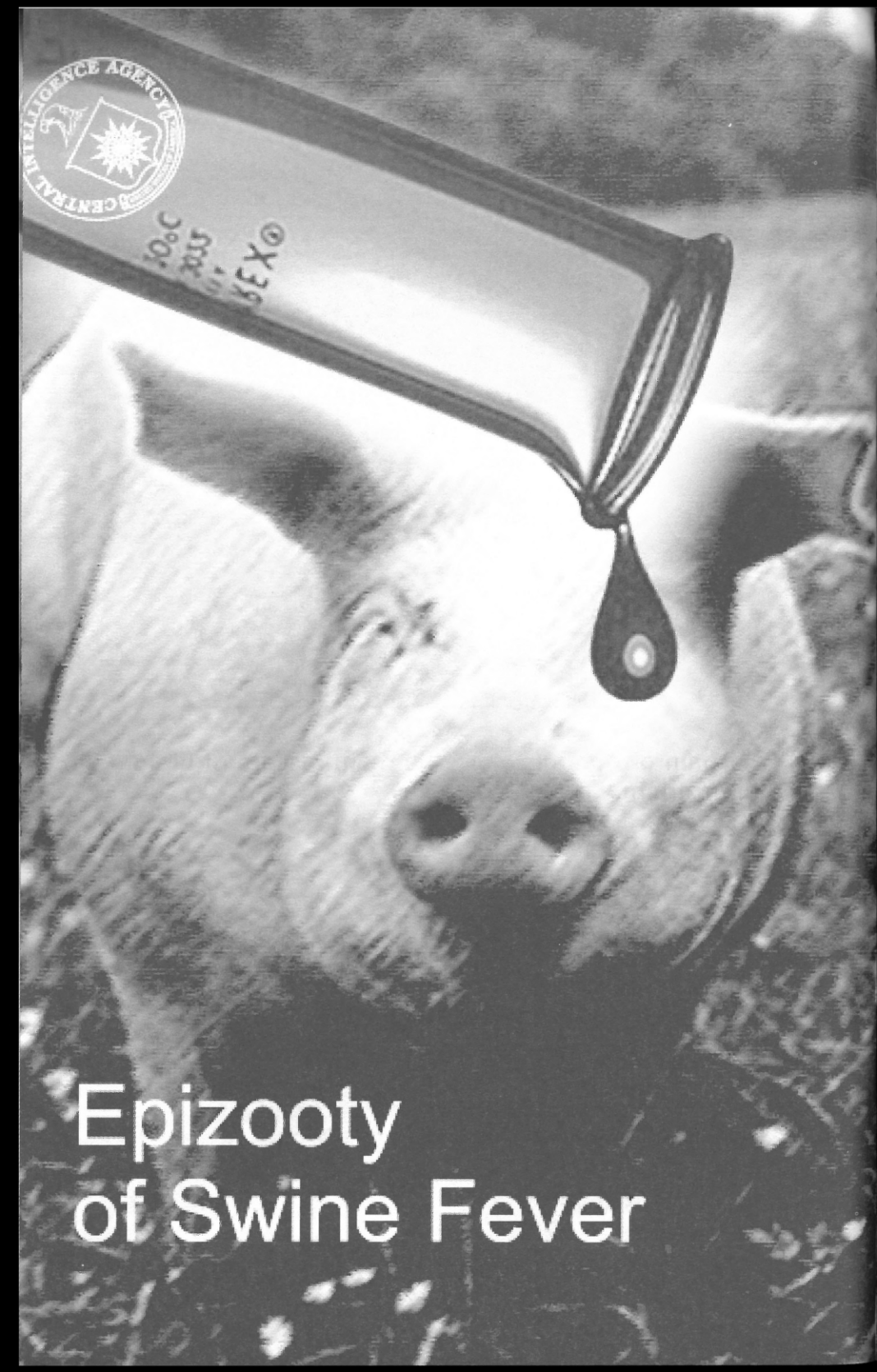
98.Yunia Piñón Lorenzo
99.Yunior Álvarez Fleites
100. Norka Sosa Cot



CENTRAL INTELLIGENCE AGENCY
Hemorrhagic
Conjunctivitis

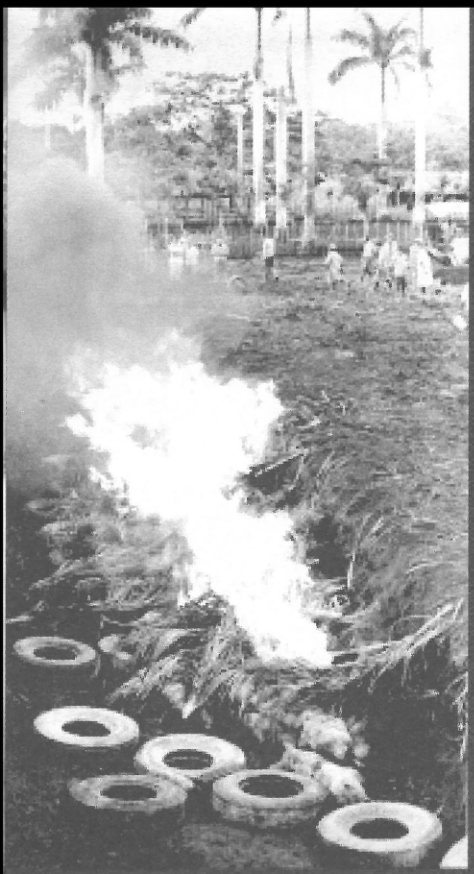
The dengue epidemic had hardly been eradicated when another "mysterious" disease came up without any logical explanation. The healthcare authorities were unable to determine how it came to our country.

Again our people were the main targets of biological terrorism.*


CENTRAL INTELLIGENCE AGENCY
Epizooty
of Swine Fever

It became necessary to slaughter over 400 thousand pigs to eradicate the outburst of African swine fever introduced in Cuba by the CIA with the purpose of starving the Cuban people to death.

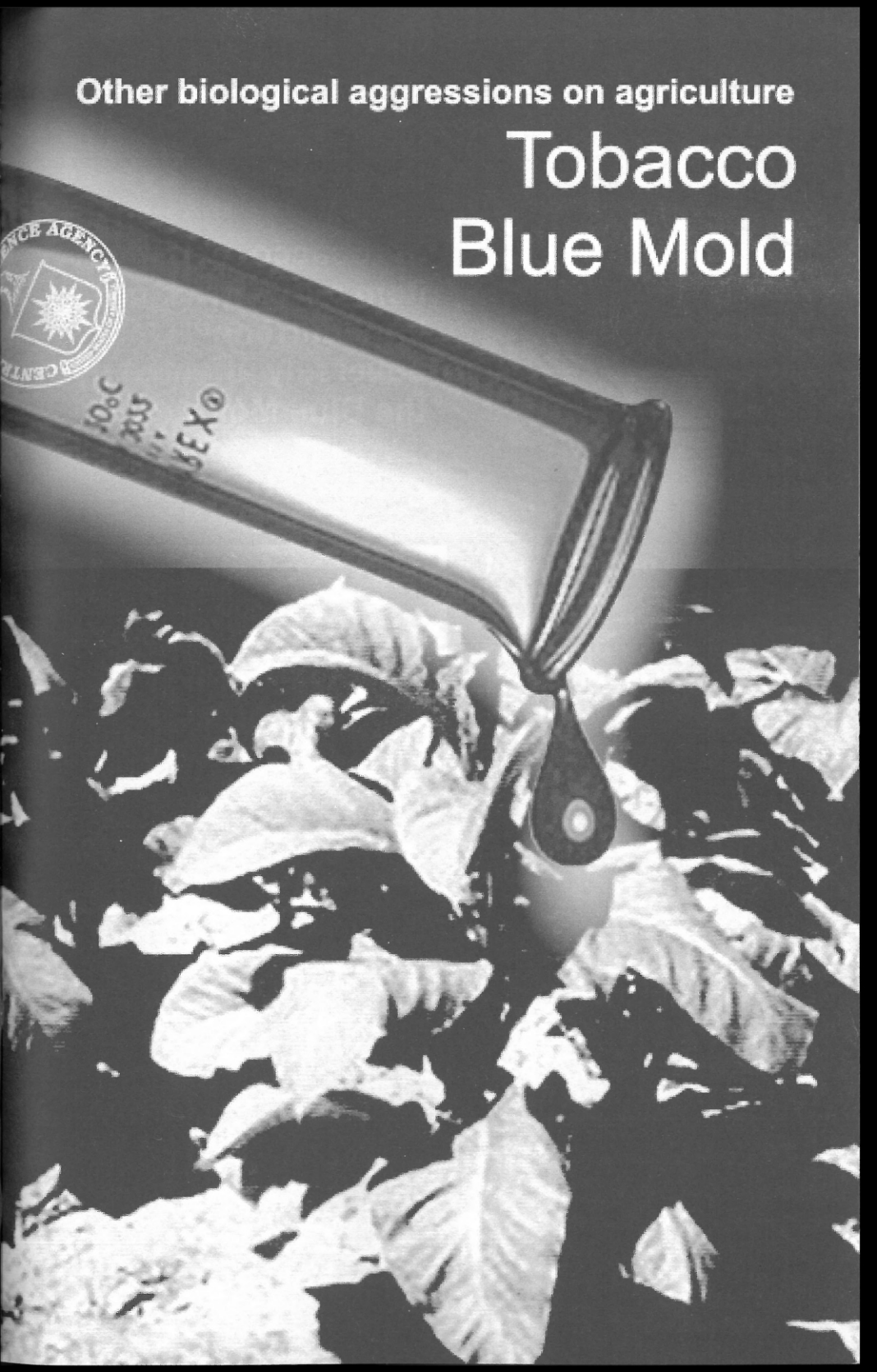
Lots of resources were invested and a great effort made by thousands of workers to tackle this new biological aggression.



Every pigs-breeding farm in the provinces of Guantanamo and Santiago de Cuba were hit. The quarantine that ensued limited these provinces food supplies for several years.

Other biological aggressions on agriculture

Tobacco Blue Mold

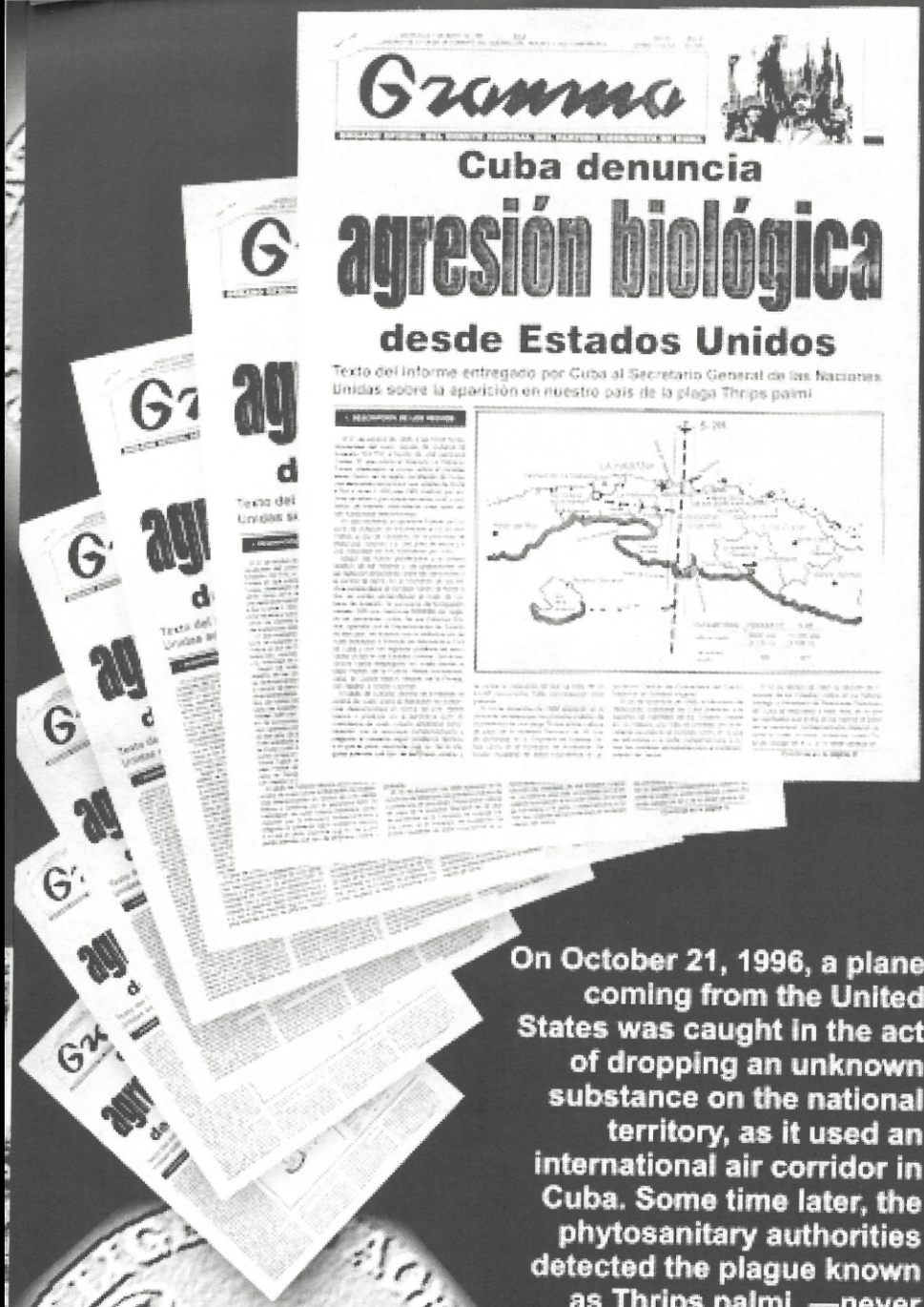


In the 1970s, several of the countries main crops were hit by plagues. In the case of tobacco, an export item and source of hard currency, was adversely affected by the Blue Mold.

Thousands of hectares of this crop were completely devastated by the disease. This caused a significant decrease of the country's income from the sales of the product.

The resources invested to control the fungus and to buy fungicides adversely affected the economy, raising the cost of tobacco cultivation and production.

The banana plantations were also hit in the 1990s.



On October 21, 1996, a plane coming from the United States was caught in the act of dropping an unknown substance on the national territory, as it used an international air corridor in Cuba. Some time later, the phytosanitary authorities detected the plague known as Thrips palmi, —never before reported in the country— in the potato plantations and other food crops, in the provinces of Havana and Matanzas.

The Thrips palmi karay: a new aggression, a proven hypothesis

In the chapter on hemorrhagic dengue reference was made to aerobiology, thus named by military specialized in bioweapons, and to the use of the aviation as the ideal way to introduce the agents of biowarfare and bioterrorism. The hypothesis was also raised of this as the only possible way of introduction of hemorrhagic dengue in Cuba. The following story could not be more eloquent; and, in fact, it constitutes irrefutable evidence.

On October 21, 1996, at 10:08 a.m., an experienced captain from Cubana Airlines piloting flight 710 between Havana City and Las Tunas through the Girón international air corridor on board a Fokker 27, could see —and so did his co-pilot— a fumigation plane, type S2R, registration number N-3093M, corresponding to the United States registration of civilian planes, moving from north to south through the same corridor. But this plane was intermittently spraying an unknown substance, an action it repeated about seven times.

The pilot immediately reported the incident to Havana Air Traffic Control, and the flight controller made contact with the American aircraft asking if it had any technical difficulties. The pilot's response was negative.

But, what was this substance sprayed by that plane over our territory? The Cuban scientists started working right away. The Cuban authorities posed many questions to the specialists who for many years had been fighting biological aggressions against Cuba and accumulating experience. The experts suggested to keep in mind

the hemorrhagic dengue introduced in the country in 1981 and the hypothesis set forth then about the means and ways of introduction.

If, as suspected, the substance dropped on the territory was another biological agent introduced as a bioterrorist action, they had to determine what it was. Thus the healthcare, veterinarian and plant sanitation services were alerted to monitor the area between the east of Havana province and the west of Matanzas province, in the proximity of the air corridor. They had to be watchful for any unusual development.

It was the right thing to do, for on December 18th that same year the specialists in Plant Protection and Quarantine form the Plant Sanitation Services detected, right on this area, a new exotic plague never before reported on the island.

The entomologists from the Central Quarantine Laboratory and the Plant Sanitation Research Institute from the Cuban Phytosanitary Services identified the Thrips palmi.

WHAT'S THE THRIPS PALMI? WHY THIS PLAGUE?

This insect was first detected in Africa in 1925. It is very resistant to the pesticides used to fight it. Its quick proliferation is favored by high temperatures and drought. This and its aggressiveness on the crops make it a good choice for biowarfare.

The Thrips palmi is a polyphagous plague which can feed on many plants and affect many crops. It is a voracious insect with mandibles adjusted to scrape off the fleshy part of the leaves. But, most important and the reason for its use in the biowarfare, a good number of the plants attacked by this plague are significant both economically and as foodstuff for humans.

In the case of Cuba, this calamity affected a large part of the potato, black beans, and cucumber, pepper, eggplant and green beans plantations. Additionally, the Thrips palmi affected corn and other corps. And this happened at a particularly hard time in the history of the Cuban people described as the Special Period. This was an economic crisis resulting from the demise of the socialist block when the island lost overnight 85% of its commercial

exchanges which led to an acute food shortage, among other things.

This bioterrorist action was aimed at destroying one of the most important crops, and sought-after product, a staple in the Cuban basic diet secured by the Cuban state for its people: potato. The potato plantations were growing at the moment with the prospect of helping to alleviate the food shortage. In those years, the production had risen to 800,000 pounds per caballería (1 caballería equals 36.1 acres). Another devastated crop was that of beans.

Another characteristic of the Thrips palmi is that in addition to the "mechanical" damages it causes, this insect acts as a vector of multiple viruses making it more harmful.

Also its own development and reproduction make it more difficult to fight this plague. The female lays its eggs inside the fleshy part of the leaves making it practically impossible to eliminate them. The larvae live on the back of the leaf where the adults feed. This protects them from pesticides. The pupa, that is, the intermediate stage between the larva and the adult, falls and remains there until it becomes an adult ready to attack the plant again. In the countries where it has established itself it has been resistant to insecticides. And it quickly develops resistance to third generation products.

DAMAGES CAUSED

When it comes to a United States aggression against Cuba one cannot disregard the principles guiding the perpetrators and the foreseen consequences. Some of these would be: the damage caused to the crops, the livestock or the people; the uncertainty and panic of the population; the economic losses due to the damaged crops and the purchase of products to bring it under control.

This Thrips palmi plague caused, firstly, the loss of the potato and beans crops. It was also necessary to change the technology for the application of the products, and to look for new ones. All of this amounted to 32.4 million US dollars, with an additional 2.9 million annually required to keep control of the plague, of which 2 millions are used only to secure the potato crops.

How can such an aggression be justified when they are caught in fraganti?

After the U.S. plane was observed in the act of spraying the substance Cuba presented its protest, demanding an explanation from the U.S. government. The response could not be more 'naïve' and disrespectful. The State Department responded that the plane was using smoke to indicate its position. In the age of computers, sophisticated navigation instruments, spaceships, radars, smart weapons and laser beams, when even the smallest ships find orientation with the Global Positioning System (GPS), how can anyone believe that an aircraft is making smoke signals to indicate its position? Such signals are only used in air sports festivals.

They were perhaps conjuring up the routines of the Western movies when the American Indians made smoke signals to communicate from a distance.

The Granma newspaper, official organ of the Communist Party of Cuba, published a series of technical considerations referring to the State Department statement with regards to the discharge of unknown substances while flying over the Cuban territory. Some of the information goes as follows:

"On May 5, 1997, the United Nations Secretary General circulated to the General Assembly official document A/52/128, dated 4/29/1997 containing a detailed report on the appearance in Cuba of the plague known as Thrips palmi. The report not only gave details of the incident involving aircraft S2R, American registration number N3093M, but it also offered the results of the investigations which clearly and definitely linked the episode with the outbreak of the terrible plague in Cuba as part of a bioterrorist action.

"On May 6, the United States made a public statement in response to the Cuban report. They gave the incredible version that the aircraft was following "sensible air safety procedures that mark its position with smoke," and that every such aircraft are equipped with smoke generating devices to that end. They added that during long journeys, the tanks where they usually carry pesticides are used to carry the fuel required."

Lies and deception; the rules and regulations of the International Civil Aviation Organization (ICAO) do not include one es-

tablishing the use of smoke generators to signal the aircrafts' position. This is not common practice.

This aircraft was flying according to flight plan IFR (Instrument Flight Rules) where the air traffic controller, and not the pilot, is responsible for the distance between flying aircrafts as the American version of the episode would have it. It's a delusion to think that the Yankee pilot, concerned over the proximity of a Cuban aircraft, decided to activate the smoke generator without previously warning the air traffic controller guiding him, as called for by the established procedure for such cases.

Additionally, it is significant that he activated the device due to the proximity of another aircraft but did not report it upon arrival at his destination, which is also an established procedure. Neither did he inform during the flight that he had any trouble on board. On the other hand, upon receiving the information from the Cuban pilot, the Havana Traffic Control Tower made contact with the American plane crew asking whether they were facing any technical problem, and the American pilot said no and made no reference whatsoever to the spraying of said substance.

The official publications consulted —Jane's All The World's Aircraft 1992-1999 Aviation Week & Space Technology from 3/16/92, among others— do not mention the smoke generator as standard equipment on the S2R-T65 aircraft.

The small, medium and big size commercial transport aircrafts, fumigation planes and others produced and operated all over the world do not have such smoke generators installed; and it is not an ICAO requirement. Only the sport and acrobatic aircrafts usually have smoke generators installed which they use in exhibition flights and similar activities.

As for the use of pesticides-carrying tanks to carry fuel, this option can truly be used in long journeys. In the case of the flight of aircraft N3993M there is evidence that such tanks were not used to carry fuel. The evidence can be sum up as follows:

- In the flight plan submitted to the corresponding Cuban authorities it registers as a ferry flight, which in aeronautics jargon means the plane was not carrying any cargo, that is, the pesticides tanks were empty, since this is the only compartment designed to transport cargo.

- The fuel tanks capacity in this plane is 228 gallons or 863 litters which gives it a range of approximately 6 hours and 30 minutes flight and a distance of about 831 miles, depending on the direction and intensity of the wind. According to that day's whether report the winds favored the flight.
- From the moment it started off until it left the Fir/Havana, through the check point Atuvi, the aircraft flew 5 hours and 15 minutes; adding 15minuts flight from Atuvi to Grand Cayman, the overall time of flight was 5 hours and 30 minutes, and the distance was approximately 600 nautical miles.
- The precise data indicate that the aircraft could fly, as foreseen, from Cocoa Beach to Grand Cayman, with the fuel it carried in the main tanks, with no need to use pesticides' tank content.
- Even admitting that the pesticide deposit was used as a fuel tank, it would be absurd to accept it had been filled to the top. The approximate capacity of the tank is 900 litters or 500 gallons, twice the capacity of the plane's main tanks.
- Filling that tank with unnecessary fuel for the flight would have increased its weight, therefore, its fuel consumption.
- If, beyond any logic, that tank had been filled with fuel for the flight, it's very unlikely they would have carried more than 100 gallons there. On the other hand, that tank can be half-filled with fuel and half-filled with any other substance ready for spraying.

All of these considerations by Cuban experts evidence the lack of seriousness of the State Department in its declaration. Apparently that country's government lacked the elements to justify the sprinkling of unknown substances over the Cuban territory.

This also shows that flights over the Cuban territory have been used for activities that contradict and violate, among others, the provisions of the Chicago Agreement Convention on Biological Weapons and its annexed documents, while bringing damage on Cuba's agriculture and population.

Was there any possibility that the plague was already in Cuba prior to the spraying of the unknown substances? The exhaustive work done by the Cuban scientists and investigators who for more than four decades have worked earnestly exposing the bioterrorist

aggressions perpetrated by the United States of America against our country dispels every doubt. Yet, after all is said and done we can still ask, is there any possibility that the plague was in the country before this incident?

The overpowering arguments were offered by Dr. Jorge Ovies, director of the Plant Sanitation Institute of Cuba, to the Anti-imperialist Tribunal examining the aggressions on the Cuban economy: such possibility is non existent. The Thrips palmi karay, as said before, is a plague that affects a number of crops consistently monitored since they are attacked by other small insects, even smaller than the Thrips palmi; also because these crops are particularly important as part of the Cuban diet and for the economy at large. Thus, the country's phytosanitary authorities must apply a very strict and binding plant protection and quarantine program.

For instance, in the case of the potato plantations the white acarus and other diseases are monitored on a daily basis, therefore, this plague would have been detected right away, even though many of these are microscopic plagues. Besides, since 1988 when there was a major outbreak of this disease in the Dominican Republic —which cut off sales of this vegetable to the U.S. market— measures were taken in our country and a defense program was established including not only additional regulations for imports of the product but also surveys throughout the island aimed at an early detection of any such infection.

Another significant scientific element is that this type of insect has been thoroughly studied in Cuba by both national and international specialists, and many papers have been published on this type of plague related to the Thrips which attack the garlic and onion plantations. This means there is plenty of knowledge to detect, identify and classify this plague, in case it had appeared in the country before. The fact that it was immediately detected, and quickly classified is proof of this. There is no possibility that this plague came naturally into the country.

The Thrips palmi karay is not a plague naturally spread or carried at great distances by the wind, but rather the insect moves from one plant to another after food and to reproduce. You can even see it moving from one furrow to another, but always within short distances, thus the wind-carrying theory is farfetched.

Definitely, this calamity is not like butterflies, lepidoptera and other insects that do fly fast and at certain altitudes, so they can be pushed away great distances by the air currents. There are also other insects that migrate from one country to another. On the other hand, in the unlikely case this had happened, the plague would have necessarily appeared first in the small keys and coastal areas, particularly in the eastern provinces (closer to the Dominican Republic) and not in the western province of Matanzas, exactly under an air corridor where the aggression was eye-witnessed.

Another possible way of introduction, through the import of vegetables, was also dismissed since from the moment the alert was issued the import of products from affected countries was banned, while the imports from other countries were exhaustively scrutinized. Therefore, the plague would have been detected by the authorities and specialists in the border quarantine.

Finally, the possibility of introduction through imports was studied including weeds, such as, barnyard grass, grain amaranth and pigweed on idle land, which proves that the only possible way of introduction was from the air during the action eye-witnessed and reported by the Cuban pilot.

Following this comprehensive analysis of the research by Cuban scientists and experts, there is no doubt that what the plane sprayed —in an overt bioterrorist action against Cuban agriculture— was the Thrips palmi karay plague. Its objective was to completely destroy crops which are an important part of the Cuban diet particularly at a time of crisis, during the Special Period. "Science without conscience is but ruin of the soul." The readers shall draw their own conclusions.

A "tamed" fauna

There is abundant specialized scientific bibliography on many interesting features related to the migration of birds, insects, bats, fish and cetaceans, as well as other marine mammals; about their impact on the ecology of the biological means and their role in the transportation and dissemination of these around the world. Examples of these are the mosquitoes, the ticks, the rodents and some insects which constitute aggressive plagues.

The specialists in biowarfare are not unaware of this knowledge. Some species like birds and cetaceans have been thoroughly studied by conscienceless scientists.

MIGRATORY BIRDS

Most birds usually migrate within the same country while others migrate from one country to another, basically due to seasonal changes reflected on food sources such as fruits and insects. The latter are known as migratory birds.

Our country is located in one of the corridors used by migratory birds, known as Neartic-Neotropical corridor. This is used every year by the birds migrating from north to south during the autumn-winter season and back in the spring. This process occurs in the months of September and October through April and May. Thus, millions of birds from hundreds of different species visit our country every year.

In Cuba, we recognize two types of migratory birds:

- Those reproducing in North America and migrating to Cuba or South America in winter;
- Those reproducing in Cuba and migrating to South America in the winter.

The first group is divided into winter residents, that is, those spending winter in Cuba, and winter non-residents; these spend a few days in Cuba during autumn and then head for South America.

This migratory schedule is perfectly known by American scientists who have studied every detail through a sophisticated system of capture, tagging and recapturing of birds controlled by computers and allowing them to learn of the specific spots where the birds reproduce, their migratory routes and their final destination.

As a rule, the birds reproduce in certain places and move to specific places every year which makes them useful to transport biological agents to certain areas. This possibility has been examined by the scientists of terror who have used it against our country in, at least, two occasions.

Among the entities involved in the study of migratory birds is the Center for Bird Tagging at Patuxent in Laurel city, Maryland; the Smithsonian Institution and the Fish and Wild Life Service. The results of their studies have been used by the CIA and the Pentagon.

In the text mention was made of the connection between migratory birds and the outbreak of *Newscastle* in Baracoa and Santiago de Cuba, and of the African swine fever. In the case of the former it was possible to determine how before the disease was detected a group of U.S. scientists had visited those places and conducted *in situ* studies of migratory birds.

In addition to the tagging system other more sophisticated methods use miniaturized radio equipment to locate the birds. These issue a signal received by other equipment which allows to exactly locate the bird's position and to determine its migration route.

Regarding the technique, in 1982 a group of American scientists from the National Audubon Society —a private institution involved in studies and research on wild life, particularly birds— requested permission to come to Cuba and research at the Ciénaga

de Zapata (Zapata Swamps) with a view to locating the sparrow hawk.

According to the elements provided but those scientists, this animal was disappearing from Florida; a population of 650 had decreased to 222 between 1980 and 1982, and they suspected the birds were at the Ciénaga de Zapata in Cuba. Significantly, the subject of study of one of these specialists was the presence of this bird in the rice plantations.

During their stay in Cuba, these scientists could not locate the sparrow hawk. They had said that 400 of their birds were tagged and that 15 of them were radio equipped.

Another example invites a reflection on the migratory birds: These birds, the same as other animals, can be natural reservoirs or hosts of various pathologies such as salmonellas, bird Chlamydia, schist somatic dermatitis, West Nile fever and several types of encephalitis transmitted from bird to man via mosquitoes, such as the equine encephalitis of the east

In 1970-1980, scientists from the Tropical Medicine Institute were able to isolate the virus causing this disease in 50 birds from 15 different species, among them, three Capromys or tree rats, one Cuban non poisonous ophidian and one iguana from the areas of Mayabeque, Ciénaga de Zapata, Guanahacabibes, Guajaibón, Isla de la Juventud, Caibarién, Cayo Rosario, Bahía Honda and Baracoa. This shows there is a real threat.

INSECTS

There are also migratory species in this group of animals, some of which are crops' pests. They include the locusts that move for hundreds of miles in swarms with 115 million animals and travel hundreds of miles a day; the dragonflies coming to our islands every year, as well as all kinds of lepidopterous or butterflies. Some species go from North America to Cape Verde, the Madeira Islands, the Pacific Ocean Islands, New Zealand, Australia and England carrying the most varied biological material.

There are also in Cuba species that move between the Antilles and the American Continent, among them, four types of dragonflies

and seven types of butterflies plus five more that move around nationally and 12 others identified as immigrants.

CETACEANS (DOLPHINS AND WHALES)

In 1960, the U.S. Navy started research on the use of marine mammals such as dolphins, whales, orcas and sea lions for military purposes. In 1971, their facilities were expanded to continue developing this program at the San Diego base in California, and in Hawaii. Three of these projects are known: the Sealab (Submarine Laboratory II), the Quickfind and the DeepOps (Deep Operations). The Air Force and NASA were also involved.

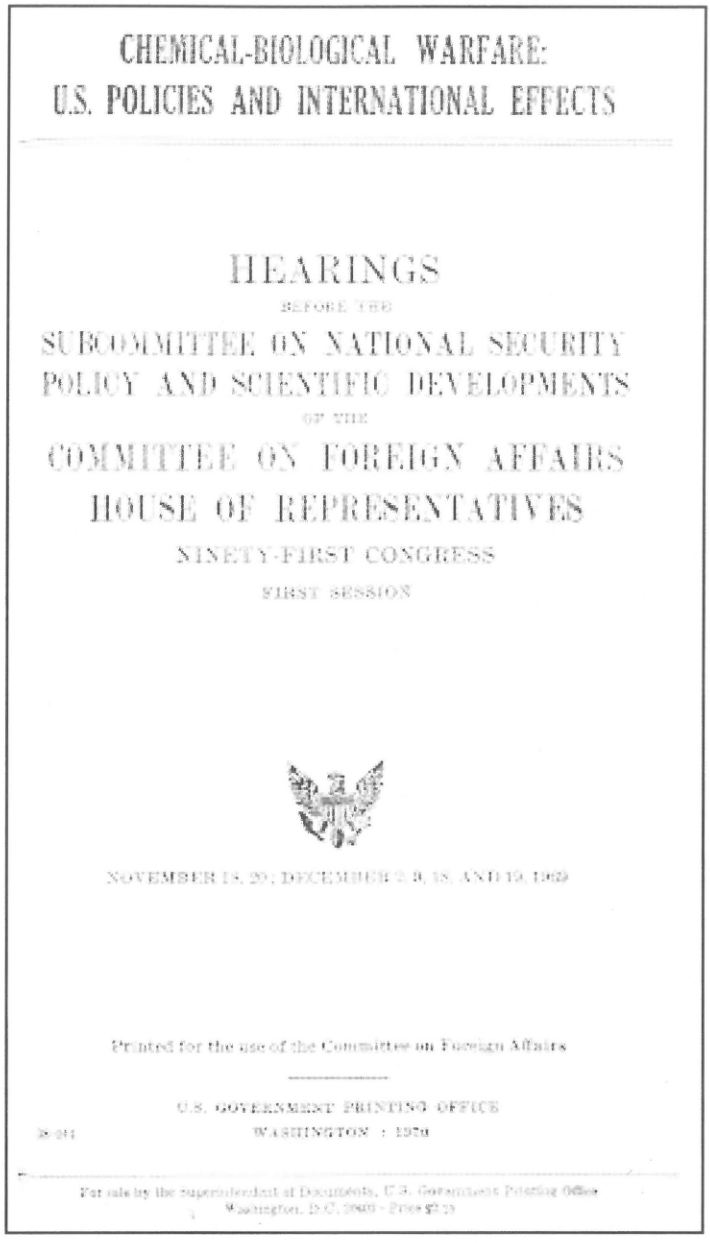
The dolphin was the mammal chosen after all studies were concluded. They were used in Vietnam and in actions against the Nicaraguan ports on the Pacific. The dolphin of choice is the bottle nose dolphin which happens to be the most abundant species in the Caribbean Sea. This dolphin can reach a maximum speed of 11 to 19 miles/hour and descend at great depth. Its lifespan is of 25 to 30 years. It uses its highly developed hearing system as sonar. When trained, they can travel at a speed of up to 60 miles/hour and submerge to more than 1500 feet. They can also work under the water for more than 10 minutes and remain out of it up to 24 hours.

Dolphins can be used to identify metals and colors. They can also carry different military equipment to preprogrammed places. They have been made to attack humans. They can locate and recover warheads, torpedoes, missiles, mines and other objects from the sea bottom. Likewise, they can be made to place mines or explosives devices in coastal facilities, submarines, ships, etc. and they can discharge missions related to radio-intelligence and radio-transmission. Dolphins can be used to protect naval facilities through patrol missions and even kill swimmers during combat missions.

Having all this potential is impossible not to think that they might be used in biowarfare. During a study on the appearance of unusual cetaceans on the Cubans coasts, it was determined that these occurred, coincidentally, a few days before or after the arrival of the Soviet Naval ships that visited the country regularly.

In addition to other mentions throughout the text, it can be said that both the CIA and the Pentagon have military research centers in Fort Detrick, on the mainland; the Center for the Study of Ticks, in Egypt; and a Research center in Pakistan where they study the use of mosquitoes, ticks and other vectors in war actions and in bioterrorism.

Annexes y Tables



CHEMICAL-BIOLOGICAL WARFARE:
U.S. POLICIES AND INTERNATIONAL EFFECTS

HEARINGS
BEFORE THE
SUBCOMMITTEE ON NATIONAL SECURITY
POLICY AND SCIENTIFIC DEVELOPMENTS
OF THE
COMMITTEE ON FOREIGN AFFAIRS
HOUSE OF REPRESENTATIVES
NINETY-FIRST CONGRESS
FIRST SESSION

NOVEMBER 18, 20; DECEMBER 2, 9, 18, AND 19, 1969

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Minutes of the U.S. Congress Committee on Scientific Development and National Security Policy where the use of biological weapons by the United States is recognized.

CHEMICAL-BIOLOGICAL WARFARE: U.S. POLICIES AND INTERNATIONAL EFFECTS

THURSDAY, NOVEMBER 20, 1969

HOUSE OF REPRESENTATIVES,
COMMITTEE ON FOREIGN AFFAIRS,
SUBCOMMITTEE ON NATIONAL SECURITY POLICY
AND SCIENTIFIC DEVELOPMENTS,
Washington, D.C.

The subcommittee met, pursuant to recess, at 9:45 a.m., in room 2255, Rayburn House Office Building, Hon. Clement J. Zablocki (chairman of the subcommittee) presiding.

Mr. ZABLOCKI. The subcommittee will please come to order.

Today is the second in a series of hearings by the Subcommittee on National Security Policy and Scientific Developments on U.S. policy concerning chemical-biological warfare.

Our more specific interest is in resolutions which have been sponsored or cosponsored by some 108 Members of Congress. These identical resolutions would express the sense of Congress asking the President to resubmit to the Senate for ratification on the 1925 Geneva Protocol on chemical-biological weapons.

On Tuesday, the subcommittee heard testimony from interested Members of Congress. Today we will hear two distinguished private citizens with expert knowledge in the field of CBW.

First, we will hear from Prof. George Bunn, visiting professor of law at the University of Wisconsin School of Law, Madison, Wis., and the General Counsel of the Arms Control and Disarmament Agency from the Agency's creation in 1961 until last year.

We are also pleased to have with us Dr. Ivan L. Bennett, Jr., the director of the New York University Medical Center in New York City.

Dr. Bennett is a former Deputy Director of the President's Office of Science and Technology and recently served as a consultant expert on the U.N. Secretary General's report on chemical and biological weapons, issued last July.

We are indeed grateful to both of you gentlemen for appearing here early today, in order that the subcommittee can conclude its hearings in time before the House goes into session to continue the consideration of the foreign aid bill.

Because Professor Bunn's testimony deals with historical aspects of the ratification of the Geneva Protocol, we will hear from him first.

Then, Dr. Bennett will discuss the recent U.N. report, its findings and its ramifications for U.S. policies on CBW.

Mr. Bunn, if you will begin, please.

(47)

At this session of Congress the use of biological weapons in covert actions is admitted.

COVERT OR USE IN SABOTAGE

Both chemical and biological agents lend themselves to covert use in sabotage against which it is exceedingly difficult to visualize any really effective defense.

For example, a relatively small quantity of a culture of virulent bacteria introduced into the ventilation system of the New York subway or sprayed upon unsuspecting passengers at an airport could certainly play havoc with our public health system.

62

It has been calculated that the placing of only 5 kilograms of botulinum toxin, a poisonous material produced by a bacterium—which, though biologically produced, would be used as a chemical weapon—into a reservoir would result in the same degree of poisoning that would be achieved by dumping 10 tons of potassium cyanide into the water supply.

I will not dwell upon this use of CBW further because, as one pursues the possibilities of such covert uses, one discovers that the scenarios resemble that in which the components of a nuclear weapon are smuggled into New York City and assembled in the basement of the Empire State Building.

In other words, once the possibility is recognized to exist, about all that one can do is worry about it.

Leaving aside, for the moment, antiplant or anticrop agents or an attack directed against domestic animals, it can be assumed that the primary purpose of an attack with chemical or biological weapons would be the incapacitation or killing of human beings.

Covert use of biowarfare in sabotage.

Both chemical and biological agents are easy to use in covert actions of sabotage and their detection is difficult by any defense mechanism.
For example, a small amount of virulent bacteria can be produced and introduced in the New York City subway system or a spray applied on certain passengers at any given airport to bring about a real calamity on the healthcare system of the country.
It has been estimated that five kilograms of botulin toxin –a poisonous material which can be subjected to certain biological procedures to be used as a biological weapon in a reservoir— introduced in a water distribution system could have a similar effect to ten tons of potassium cyanide. I'm not defending the use of biological agents other than saying that they can be used in covert actions. Actually, the scenarios are similar to those produced by a nuclear weapon, that is, if these products were spread throughout the city of New York or in the cellar of the Empire State building. In other words, once we recognize the possibility exists we only need to care about it. Putting aside for the moment the anti-plants or anti-crops agents, or a direct attack on pet animals, the assumption is that the primary objective of an attack with chemical or biological weapons could be to incapacitate or kill human beings.

The previous excerpt was taken from minutes from the U.S. Congress. It shows how the United States had recognized a long time ago the covert use of biological agents in sabotage and bioterrorism.

BW PLANNED FOR CUBA INVASION?

Mr. FRASER. It has been said the United States was prepared to use biological agents with regard to the invasion of Cuba. Can you tell us whether or not that is true?

Mr. PICKERING. I just have no knowledge of that.

Mr. FRASER. Has anyone here any information on that question? (No response.)

Mr. PICKERING. I have seen the discussions of this subject in the press.

Mr. MCCARTHY. I would say the Senate Foreign Relations Committee is familiar with the incidents alluded to and there are people in the Government who know what the record is, present and past. I know the information is available in your records.

Mr. FRASER. The reason I ask this is that to a modest degree at least I have the impression that you are called upon, *post facto*, to defend whatever position has been developed in our military planning. That is, I don't feel that the limits are clearly established in the first instance by careful examination of our responsibilities in the international community. There is some looseness here which make it possible to first make military plans which only later are you called upon to defend.

Mr. PICKERING. I think that going back to the President's decision, if there was looseness before, this tends to pin it down. I think this is now national policy reflecting on the military and us alike.

In the same session of the U.S. Congress the use of biological weapons is admitted in covert actions of sabotage.

Plans of biological warfare for a Cuba invasion.

Mr. Fraser.- It has been said that the United States was prepared to use biological agents with regard to the invasion of Cuba. Can you tell us whether or not this is true?

Mr. Pickering.- I just have no knowledge of that.

Mr. Fraser.- Has anyone here any information on that question?

(No answer)

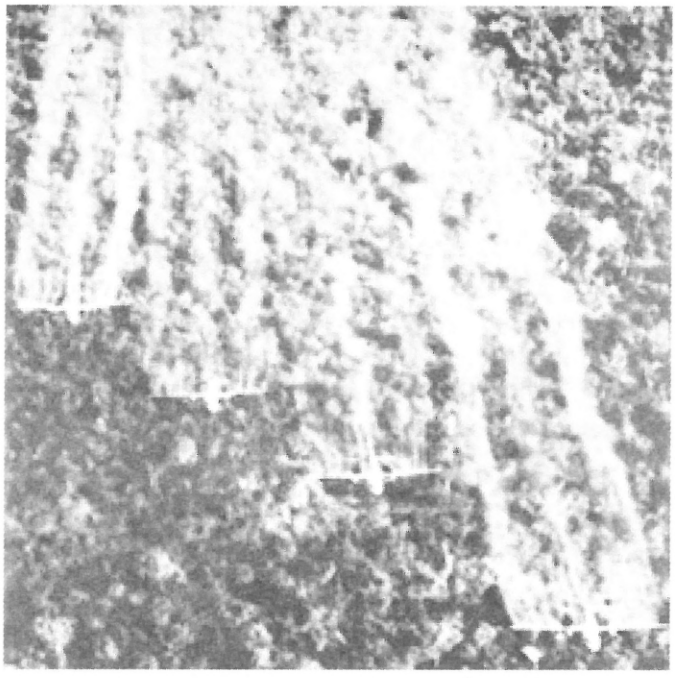
Mr. Pickering.- I have seen the discussion of this subject in the press.

Mr. McCarthy.- I would say the Senate Foreign Relations Committee is familiar with the incidents alluded to and there are people in the Government who know what the record is, present and past. I know the information is available in your records.

Mr. Fraser.- The reason I ask is that to a modest degree at least I have the impression that you are called upon, *post facto*, to defend whatever position has been developed in our military planning. That is, I don't feel that the limits are clearly established in the first instance by careful examination of our responsibilities with the international community.

Mr. Pickering.- I think that going back to the President's decision, if there was a looseness before, this tends to pin it down. I think this is now national policy reflecting on the military and us alike.

The Senate minutes.



C-130 aircraft from the U.S. Air Forces in a chemical and biological warfare mission in Vietnam.

Fort Detrick, the main U.S. Armed Forces center for production and storage of agents designed for biowarfare.

LIST OF HUMAN DISEASES OF INTEREST FOR BIOWARFARE

- Antrax
- Blastomycosis
- Botulism
- Brucellosis
- Coccidiomycosis
- Cholera
- Chriptococcosis
- Chincungunya fever, O'Nyong-Nyong fever, Mayaro fever y Ross River bank fever.
- Paratyphoid fever
- Q fever
- Acute Gastroenteritis
- Infectious Hepatitis type A and B
- Histoplasmosis
- Influenza.
- Lassa fever
- Dengue
- Dysentery —parasitic and bacterial
- Stafilococcosis
- Encefalitis
- Yellow fever
- Rocky Mountains fever
- Typhoid fever
- Rift valley fever
- Melioidosis
- Carbuncus
- Malaria
- Pest
- Tifus
- Tularemia
- Small pox

DISEASES AND PLAGUES AFFECTING PLANTS INTERESTING FOR BIOWARFARE

- Sugarcane rust
- Sugarcane smut
- Sugarcane Fiji disease virus
- Black sigatoka disease of banana
- Potato rust disease
- Leaf blight of rice
- Brown spot of rice
- Stem rust of cereals
- Crown rust of barley
- Leaf blight of maize
- Tobacco mosaic virus
- Potato pests
- Citrus tristeza closterovirus

INSECTS AND OTHER HARMFUL ANIMALS

- Japanese beetle
- Mexican bean beetle
- Cotton weevil
- Locusts
- Nematodes
- Giant African ground snake
- Sugarcane leafhopper; Fiji vector
- Black citrus aphid, vector of the Citrus tristeza closterovirus
- Locusts or grasshoppers
- Wheat fly
- Mediterranean fruit fly
- Maite caterpillar
- Rice leafhopper
- Thrips palmi karay

LISTO F ANIMAL DISEASES OF INTEREST FOR THE BIOLOGICAL WAR

- Aftose fever
- Yellow fever
- Antrax
- Avian infectoius bronchities
- Brucellosis
- Botulism
- Swine cholera
- Chagas disease
- Fallen flowers syndrome
- Equine encephalitis —east, west and Venezuelan
- Vesicular exantema
- Filaria
- Gumboro
- Avian influenza
- Q fever
- African swine fever
- Bovine bacillus icterus hemoglobinuria
- Leismaniasis
- Leismaniasis
- Melioidosis
- Morrilla
- Newcastle
- Peste
- Psitacosis —chlamidyiasis.
- Rabies
- Toxoplasmosis
- Tuberculosis
- Tularemia
- Rocky Mountains fever
- West Nile fever
- Rift Valley fever
- Small pox

CIRCULATION OF DENGUE IN THE WORLD

Table No.1
Dengue in Southeast Asia

Date	*Type*	*Place*
Before 1954	3 y 4	the Philippines and others
1954	1	the Philippines
1958	1 y 2	Thailand
1958	1, 2, 3 y 4	Indonesia
1963	2	India (Calcuta)

Table No. 2
Dengue in South Pacific

Date	*Type*	*Place*
Before 1954	1	Australia, Japan, New Guinea, Fiji, Hawaii, Soledad Islands
1964	3	French Polynesia
1969	3	"
1971	2	Fidji y French Polynesia
1972	2	Papua, Guinea, New Caledonia, Gilbert Ellice, New Hybrides and Tonga
1973	2	Fiji-Tahiti
1974	2	Tonga
1974	3	French Polynesia
1974	1 y 2	Nauru Islands, Gilber Ellice, Fiji, New Hybrides, Tahiti
1975	1 y 2	Fiji

Table No. 3
Dengue in the Mediterranean

Date	*Type*	*Place*
1881	-	Crete
1882	-	The Piraeus
1927	1 y 2, retrospective studies	Athens and ports in the Black Sea

Table No. 4
Dengue in Africa

Date	*Type*	*Place*
1921	1	South Africa
1925	-	West Africa
1944	1	East Africa
1966-1970	1 y 2	Nigeria

Table No. 5
Dengue in the Americas

Date	*Type*	*Place*
1827-1953	-	Numerous epidemics in the Caribbean
1941-1942	2	Panama
1952	2	Trinidad
1963	3	Puerto Rico
1968	2	Trinidad and a large part of the Caribbean
1969	2	Colombia
1971-1977	2 y 3	Endemic to the Caribbean
1977	1	Jamaica, expands to the whole Caribbean
1981	4	Dominica, Guadeloupe and other islands
1981	2	Cuba

Table no. 6
Dengue situation in the Caribbean

Countries	*Years*							
	41 42	52 54	63 64	68 69	71 72	76 77	77 78	80
Panama	2 y 3	-	-	-	-	-	-	-
Trinidad	-	2	-	2	-	-	1	-
Porto Rico	-	-	2 y 3	2	-	2	1, 2 y 3	-
Jamaica	-	-	3	2 y 3	-	-	1	-
Cuba	-	-	-	-	-	-	1	2
Santo Domingo	-	-	-	-	2 y 3	-	-	-
Haiti	-	-	-	2	2	-	2 y 1	-
Bahamas	-	-	-	-	-	-	1	-
Colombia	-	2	-	-	2	3	1	-
Venezuela	-	-	3	2	-	-	2	-
Guyana	-	-	-	-	-	2	2 y 1	-
Surinam	-	-	-	-	-	-	1	-
Martinique	-	-	-	-	-	-	1	4
Guadeloupe	-	-	-	-	-	-	2 y 1	4
Virgin Islands	-	-	-	-	-	-	2 y 1	-
Saint Vincent	-	-	-	-	-	-	1	-
Antigua	-	-	-	-	-	-	1	-
Granada	-	-	-	-	-	-	1	-
Curacao	-	-	-	-	-	-	1	-
Barbados	-	-	-	-	-	-	1	-

All these Tables reflect the official data of the WHO/PAHO. These clearly show that at the time of the Cuba dengue 02 outbreak, in 1981, this serotype was not circulating in the world.

First case of the first source of infection (Baluarte community)

Patient	*Title NP Dengue 2*
V.A.	1 770

- He did not suffer from dengue in 1977.
- He fell ill on December 20, 1980.
- He did not fall ill again in 1981.
- The sample was taken 10 months later.

The conclusion is he suffered from dengue on December 1980.

Second case from the first source of infection (Baluarte community)

Patient	*INHEM*		*IPK*			
	FC		*HI*		*FC*	
	D1	D2	D1	D2	D1	D2
V.A.	1:80	1:80	1:80	1:60	1:80	1:80

- He didn't suffer from dengue in 1977.
- He fell ill in January 1981.
- He didn't fall ill again through 1981.

The conclusion is that he suffered from dengue in January 1981.

Legend:

INHEM (by its Spanish acronym)- National Institute of Hygiene, Epidemiology and Microbiology

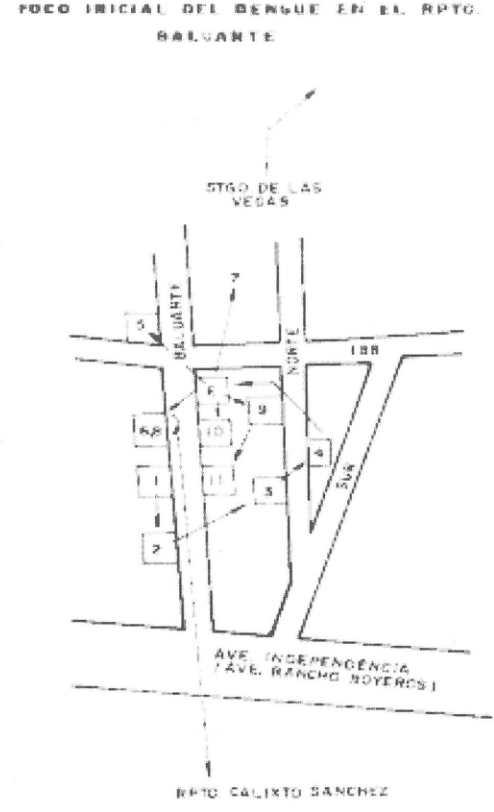
IPK (by its Spanish acronym) – Pedro Kouri Tropical Medicine Institute

FC - Fixing complements. Diagnosis techniques

NP - Neutralization in petri

HI - Inhibition of dengue serologic hemoagglutionation

D1, D2 – dengue serotype



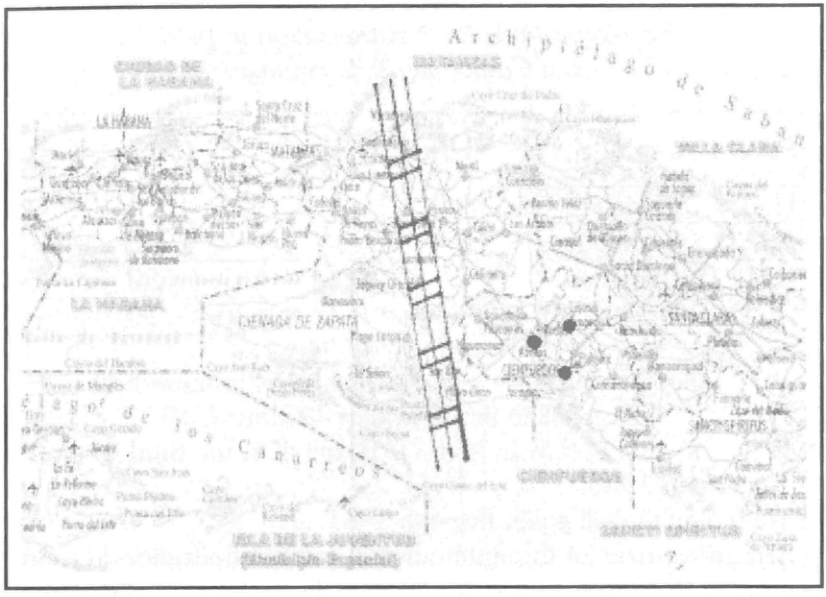
Initial source of dengue infection at Reparto Baluarte.

Serological results. Neutralization in petri
Cases Camagüey & Cienfuegos

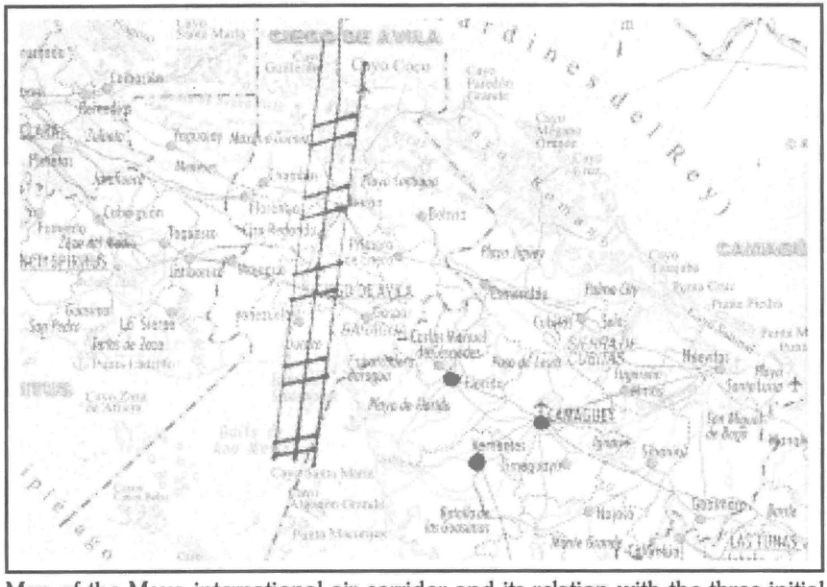
Patient /Area	*Stages of the disease*		
	Acute	*Convalescing*	*6-7 months later*
H.G.D. / Florida	760	1 000	910
A.M.D. / Camagüey	1 000	1 000	1 000
S.M.L. / Vertientes	390	1 000	580
J.C.B. / Cienfuegos	-	1 000	70

These patients are a sample of the first cases in these areas.

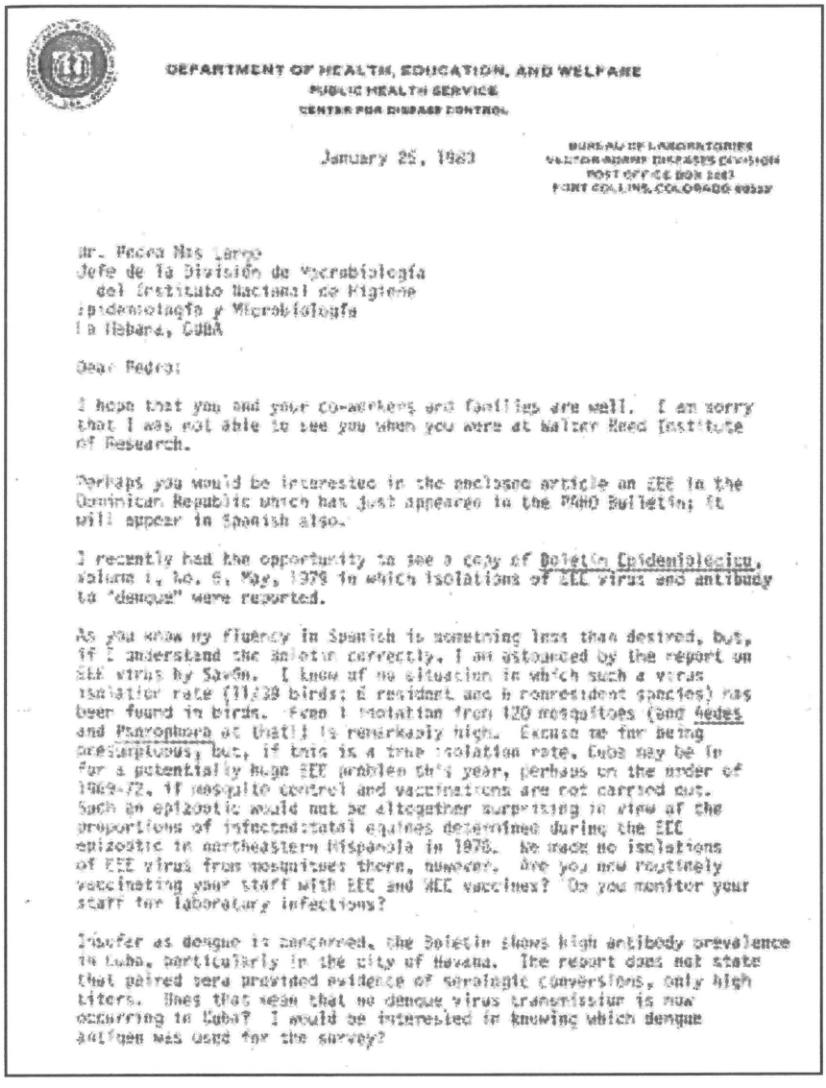
- Patient A.M.D. fell ill in the month of January 1981.
- Patients H.G.D., S.M.L. and J.C.B. fell ill in the third week of December 1980.
- They didn't fall ill again through 1981.
- The movement of the antibodies in the neutralization in petri test, from samples taken in three different stages, show that they suffered from dengue in those dates.



Map of the Giron international air corridor and its relation with the three initial sources of dengue infection in the province of Cienfuegos. Note: the black dots point the position of the initial sources of infection.



Map of the Maya international air corridor and its relation with the three initial sources of dengue infection in the province of Camaguey. Note: The black dots point the position of the initial sources of infection.



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL

January 25, 1983

BUREAU OF LABORATORIES
VECTOR-BORNE DISEASES DIVISION
POST OFFICE BOX 2087
FORT COLLINS, COLORADO 80522

Mr. Pedro Más Largo
Jefe de la División de Virología
del Instituto Nacional de Higiene
Epidemiología y Microbiología
La Habana, CUBA

Dear Pedro:

I hope that you and your co-workers and families are well. I am sorry that I was not able to see you when you were at Walter Reed Institute of Research.

Perhaps you would be interested in the enclosed article on EEE in the Dominican Republic which has just appeared in the PAHO Bulletin; it will appear in Spanish also.

I recently had the opportunity to see a copy of Boletín Epidemiológico, volume 1, No. 6, May, 1979 in which isolations of EEE virus and antibody to "dengue" were reported.

As you know my fluency in Spanish is something less than desired, but, if I understand the bulletin correctly, I am astounded by the report on EEE virus by Sweo. I know of no situation in which such a virus isolation rate (11/38 birds; 6 resident and 5 nonresident species) has been found in birds. Even 1 isolation from 120 mosquitoes (and Aedes and Psorophora at that!) is remarkably high. Excuse me for being presumptuous, but, if this is a true isolation rate, Cuba may be in for a potentially huge EEE problem this year, perhaps on the order of 1969-72, if mosquito control and vaccinations are not carried out. Such an epizootic would not be altogether surprising in view of the proportions of infected:total equines determined during the EEE epizootic in northeastern Hispaniola in 1978. We made no isolations of EEE virus from mosquitoes there, however. Are you now routinely vaccinating your staff with EEE and WEE vaccines? Do you monitor your staff for laboratory infections?

Insofar as dengue is concerned, the Boletín shows high antibody prevalence in Cuba, particularly in the city of Havana. The report does not state that paired sera provided evidence of seroloqic conversions, only high titers. Does this mean that no dengue virus transmission is now occurring in Cuba? I would be interested in knowing which dengue antigen was used for the survey?

From the 1970s, U.S. Armed Forces Colonel Charles H. Calisher starts showing continuous interest in the dengue in Cuba and urging Cuban scientists to publish their papers on the subject in foreign publications.

Page 2 - Dr. Pedro Mas Largo

I certainly am pleased to see that Cuba is actively engaged in arbovirus studies. If we can assist, please let Dr. Bond know.

Would it be possible to receive, on a regular basis, your Boletin Epidemiologico?

I notice that your institute is not on our mailing list to receive the Arbovirus Catalogue and supplementary materials. I believe that you could receive these by contacting Dr. Nick Karabatsos at this address.

Meanwhile, I remember with fondness my visit to Cuba and to your laboratory and look forward to the day that I can return.

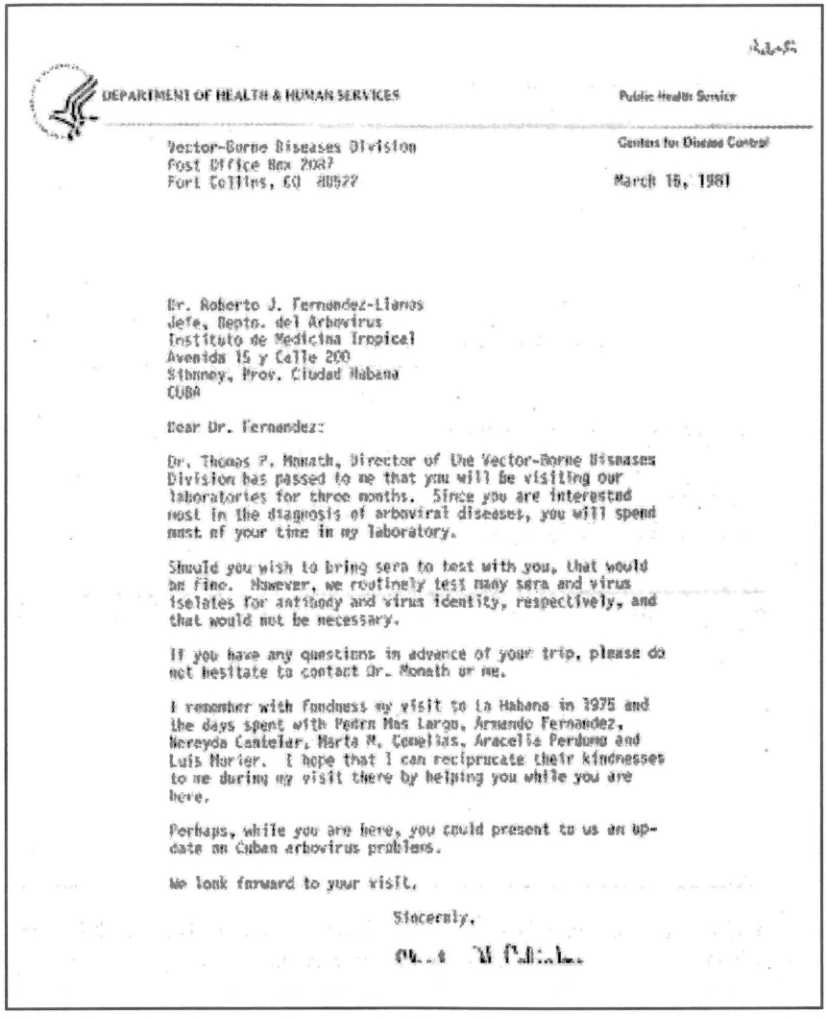
My best regards to Nereyda Cantelar, Armando Fernandez, Marta Comellas, Aracelia Perdomo and Luis Morier.

Sincerely.

Charles H. Calisher, Ph.D.
Chief, Arbovirus Reference Branch

Enclosures

cc:
Dr. J. Bond (w/encl)
Dr. T. Monath (w/encl)



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Vector-Borne Diseases Division
Post Office Box 2087
Fort Collins, CO 80522

Centers for Disease Control

March 16, 1981

Dr. Roberto J. Fernandez-Llamos
Jefe, Depto. del Arbovirus
Instituto de Medicina Tropical
Avenida 15 y Calle 200
Siboney, Prov. Ciudad Habana
CUBA

Dear Dr. Fernandez:

Dr. Thomas P. Monath, Director of the Vector-Borne Diseases Division has passed to me that you will be visiting our laboratories for three months. Since you are interested most in the diagnosis of arboviral diseases, you will spend most of your time in my laboratory.

Should you wish to bring sera to test with you, that would be fine. However, we routinely test many sera and virus iselates for antibody and virus identity, respectively, and that would not be necessary.

If you have any questions in advance of your trip, please do not hesitate to contact Dr. Monath or me.

I remember with fondness my visit to La Habana in 1975 and the days spent with Pedro Mas Largo, Armando Fernandez, Nereyda Castelar, Marta M. Complias, Aracelis Perdomo and Luis Marier. I hope that I can reciprucate their kindnesses to me during my visit there by helping you while you are here.

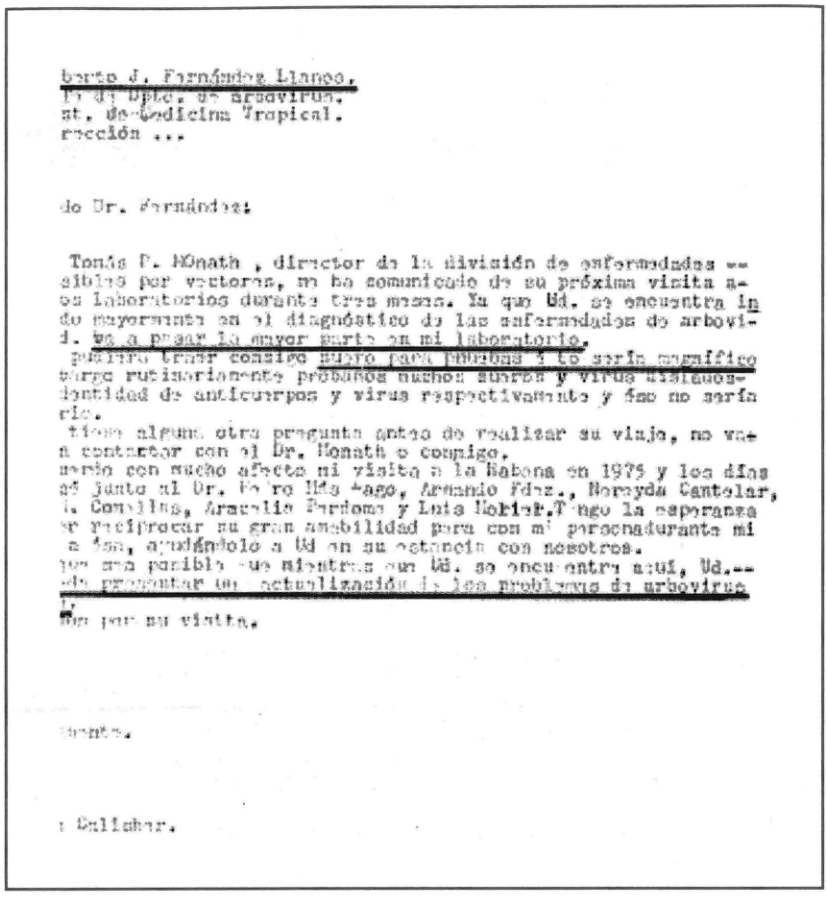
Perhaps, while you are here, you could present to us an update on Cuban arbovirus problems.

We look forward to your visit.

Sincerely,

[illegible]

He shows increasing interest in the months prior to the introduction of the disease.



bert J. Fernández Llanes,
Jefe del Dpto. de Arbovirus.
st. de Medicina Tropical.
rección ...

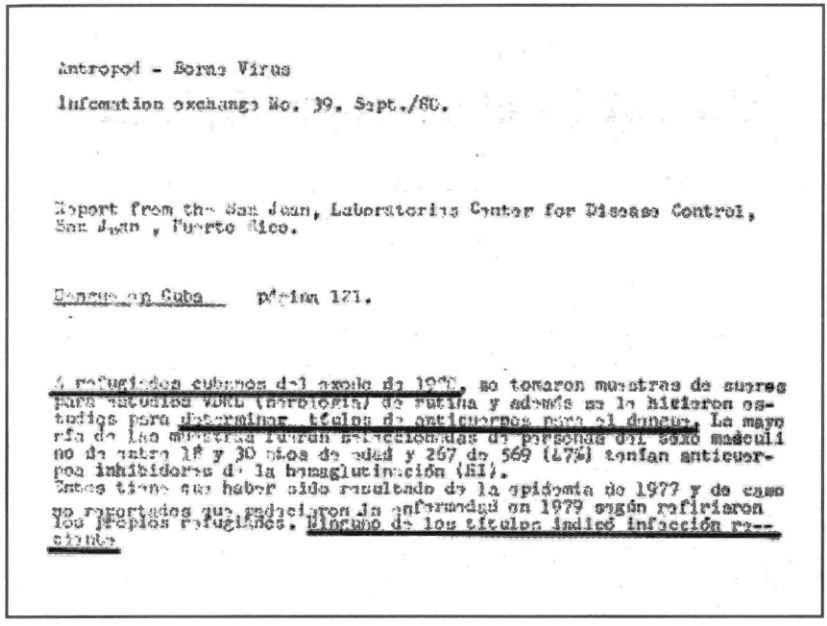
do Dr. Fernández:

Tonás P. MOnath , director de la división de enfermedades -- sibles por vectores, me ha comunicado de su próxima visita a- os laboratorios durante tres meses. Ya que Ud. se encuentra in do mayormente en el diagnóstico de las enfermedades de arbovi- d. va a pasar la mayor parte en mi laboratorio.
podría traer consigo sueros para pruebas y lo sería magnífico para rutinariamente probamos muchos sueros y virus diferentes- identidad de anticuerpos y virus respectivamente y Ese no sería rio.
tiene alguna otra pregunta antes de realizar su viaje, no vac a contactar con el Dr. Monath o conmigo.
sario con mucho afecto mi visita a la Habana en 1975 y los días st junto al Dr. Pedro Más Lago, Armando Fdez., Norayda Cantelar, L. Carrillo, Araceli Pardoma y Luis Robiar.Tengo la esperanza se reciprocar su gran amabilidad para con mi personadurante mi a Usa, ayudándolo a Ud en su estancia con nosotros.
ser muy posible que mientras usa Ud. se encuentre aquí, Ud.-- de presentar su actualización de los problemas de arbovirus
.
Mas por su visita.

Cordiales.

: Gallahar.

In the midst of the epidemic he learns that a Cuban scientist will be traveling to the United States and quickly requests strains and serum for further studies. This *modus operandi* is typically associated with biowarfare in that period. Translation of the letter he sent; obtained from the files of the Pedro Kouri Tropical Medicine Institute (IPK) in Cuba.



Antropod - Borne Virus

Information exchange No. 39, Sept./80.

Report from the San Juan, Laboratories Center for Disease Control, San Juan , Puerto Rico.

Dengue en Cuba página 171.

A refugiados cubanos del exodo de 1980, se tomaron muestras de sueros para pruebas VDRL (sífilis) de rutina y además se le hicieron estudios para determinar títulos de anticuerpos para el dengue. La mayoría de las muestras fueron seleccionadas de personas del sexo masculino de entre 18 y 30 años de edad y 267 de 569 (47%) tenían anticuerpos inhibidores de la hemaglutinación (HI).
Estos tienen que haber sido resultado de la epidemia de 1977 y de casos no reportados que padecieron la enfermedad en 1979 según refirieron los propios refugiados. Ninguno de los títulos indicó infección reciente.

The United States takes advantage of the Cuban exodus via the Mariel port, on September 1980, to update the epidemiological situation of dengue in Cuba. That same month, the United States Navy proceeded to the mysterious vaccination of its personnel at Guantanamo Naval Base.

U.S. Biological Warfare:

The 1981 Cuba Dengue Epidemic

By Bill Schaap

For more than 20 years Cuba has been the victim of American attacks, overt and covert, large and small, conventional. Ships and buildings have been bombed; cane fields have been burned; invasions have been launched; and planes have been blown out of the sky. But many of the attacks have been even less conventional. Cuba has seen its share of chemical and biological warfare – some of which has been proved, some of which has not. If the Cuban charges are true – and we believe that this article will help demonstrate that they are – then the dengue fever epidemic of 1981 was only the latest in a long line of outrageous, immoral, and illegal CBW attacks against Cuba.*

The History of Attacks

Many studies have been written on the CBW capabilities of the United States. Some have discussed specifics; some have mentioned Cuba. John Marks, Victor Marchetti, Philip Agee, and Seymour Hersh have all discussed various specifics. Shortly after the triumph of the Cuban Revolution, during the early 1960s, food poisoning attempts were common, often at the same time that crop burnings were being carried out. A Washington Post report (September 16, 1977) confirmed that during this time the CIA maintained an "anti-crop warfare" program. Both the CIA and the Army were studying biological warfare, primarily at the facilities of Fort Detrick, Maryland. Dr. Marc Lappe noted in his book, "Chemical and Biological Warfare: The Science of Public Brain," that the Army said a biological warfare agent prepared for use against Cuba at the time of the missile crisis in 1962. It was most likely Q fever. [See *Sources and Methods* in *CAIB* Number 16.]

Throughout the 1960s there were occasional biological attacks against Cuba, sometimes, according to Cuban allegations in 1964 involving apparent weather balloons. And in 1970 the CIA engineered the introduction of African swine fever into Cuba, a successful operation carried out by Cuban exile agents. [See Warren Hinckle and William Turner, "The Fish Is Red," p. 293.] It led to the forced destruction of more than a half million pigs. The same groups attempted unsuccessfully a few months later to infect the Cuban poultry industry. These operations were first exposed in *Newsday* (January 9, 1971), and later appeared in the *Washington Post*, *Le Monde*, the *Guardian*, and other papers.

Then, in 1980 – the year of the plagues – Cuba was beset with disasters. Another African swine fever epidemic hit, the tobacco crop was decimated by blue mould, and the sugar cane crops were hit with a particularly damaging rust disease. As the *Nation* put it, this was "a conjunction of plagues that would lead people less paranoid about the U.S. than the Cubans to wonder whether human hands had played a role in these natural disasters. . . ."

It is against this backdrop that the Cubans found themselves facing, in the spring and summer of 1981, an unprecedented epidemic of hemorrhagic dengue fever.

Why Dengue?

As noted above, and elsewhere in this issue, the arsenal of chemical and biological warfare is unlimited. The U.S. military and the CIA have experimented with diseases which merely make a person uncomfortable for a few hours, with human volunteers kill instantly, and with everything in between. John Marks describes a few of the study of MKULTRA, the CIA's mind control experiment. "The Search for the 'Manchurian Candidate'." Staphylococcal enterotoxin, for example, a mild food poisoning, would incapacitate its victim for three to six hours. Venezuelan equine encephalomyelitis (VEE) virus would immobilize a person for two to five days and keep its victims weak or perhaps another month; brucellosis would keep its victims in the hospital for three or more months, killing some. Even the deadly poisons were prepared with variations. Ricin or toxin kills within a few seconds, botulinum, however, takes eight to 12 hours, giving the assassin hours to get away.

Dengue fever is one of some 250 arthropod-borne viruses, or "arboviruses," diseases transmitted from one vertebrate animal to by hematophagous arthropods – blood eating insects, usually mosquitoes. Dengue is transmitted by the *Aedes aegypti* mosquito, the same insect which transmits yellow fever. There are four types of dengue – numbered 1 through 4, depending on the type of antibody which the virus induces. Normal dengue fever begins with the same symptoms as a severe cold or flu: watery eyes, runny nose, headache, backache, fever, insomnia, lack of appetite and weakness. The hint pain is incapacitating. Indeed, dengue was once known as "break bone." Its characteristic symptom is pain at the back of the eyes, most

*While it is beyond the scope of this article, it appears that the Afghan government and the Soviet government have accused the U.S. of using similar biological warfare in Afghanistan. Reports in February 1982 suggested that CIA operatives at a research center in Lahore, Pakistan, through poisoning or by engaging in riots in which rats were actually experimenting in the spread of dengue and yellow fever. The reports first appeared in Democratic Afghanistan (Kabul), Jan. 5, 1982, and were carried the next day in *TASS*.

The *Covert Action* magazine publishes in its No.17 issue of the summer of 1982 an extensive article denouncing the Cuba hemorrhagic dengue epidemic of 1981 as a biological terrorism action by the United States.

mosquito when hunting from side to side. All types of dengue can give rise to the hemorrhagic form, that is accompanied by internal bleeding and shock. This form is the most dangerous, especially in children, for whom it is often fatal.

Dengue and other arboviruses are dealt in virological culture collections for a number of reasons. Dengue 2-type, mainly hemorrhagic, dengue is highly traumatizing, a unit to be maintained inside the high containment of selected research units, with great capacity of mobility in highly prepared and alerted action. The Aedes mosquito bites during the day, when people are more active and less protected, therefore infinitely more.

Aedes mosquitoes that travel hundreds of miles before biting, consider movie actor Neal Hamilton, since dengue fever is found in many parts of the world, a female who is captured in Haiti in the afternoon and flies to the international airport of Miami, Florida, can be in Los Angeles, California, the next morning, ready to bite.

The 1981 Epidemic

Although dengue fever is rarely encountered in the Caribbean, there have been many outbreaks in the Caribbean area and Central America during the past century. At least twelve have been recorded during the last twenty years. In 1963 there was a dengue 2 outbreak in Puerto Rico and Virgin Islands; in 1969, dengue 2 was found in Jamaica, in 1977, dengue 1 was found in Jamaica and Cuba, and in 1981, dengue 4 was found in the Cayman Islands.

The epidemic which hit Cuba in May 1981 was of type 2 dengue, never encountered in the Western Hemisphere, although it had been isolated in Africa, Asia, and Australia. Except for the type 1 outbreak recorded in 1977, this was the first recorded dengue outbreak in Cuba since 1944, and, many experts in the field in the Caribbean agree, the first in the country to involve hemorrhagic shock on a massive scale.

From May 1st to October 10th, 1981 there were 344,203 reported cases, with 158 fatalities, 101 occurring in children under 15. At the peak of the epidemic, in early July, over 30,000 cases per day were being reported. (See Chart I.) More than a third of the reported cases occurred in the city of Havana, with Cienfuegos, also a major city, in the south-central part of the country, the epidemic's second most severely affected area.

The limited success of the relief war against Cuba and the resistance to the dengue epidemic were enough to generate serious concerns that the U.S. had a total of the dengue epidemic of 1981. But there is much more support for these conclusions than a handful of American calculators regarding Cuba.

The Cures

I. Hill reviewed the reports on the epidemic of the Pan American Health Organization and of the Cuban Ministry of Public Health, and interviewed a number of health officials. There are several indications that the epidemic was artificially induced.

The epidemic began with the sudden rise in cases in May, 1981 of three cases of hemorrhagic dengue related to a type 2 virus. There were no cases in these areas, separated parts of Cuba: Cienfuegos, Camagüey, and Havana. It is reasonable to assume that such a rapid, sporadic, simultaneous appearance of three different localities at once. None of the initial victims had been to other countries, for that matter, none of them had recently been away from home. None had had recent contact with international travelers. Moreover, a study of dengue activity in Cuba in the month of May, 1981 found dengue cases being only a minor part of the total. Neither Vietnam and Laos, all of whose cases checked by the Institute of Tropical Medicine and found the list of the disease. Similarly, identical mosquitoes had appeared in three provinces of Cuba at the same time. Similarly, the latter animal attacks during the day. These appears to be no other explanation but the artificial introduction of infected mosquitoes.

Moreover, how cancer conditions might be favorable to the spread of dengue epidemics in Latin America. But on the contrary, there were no epidemics taking place elsewhere in the Caribbean. Statistics published by the Pan American Health Organization show that during the first eight months of 1981, when there were over 300,000 cases of dengue in Cuba, there were no cases reported by any country in the Caribbean, and only 22 in Haiti. In addition to the Caribbean and Central America there were less than 5,000 cases of dengue, half of them in Colombia. (See Chart II.) And most significantly, none in Cuba were the cases of such hemorrhagic.

Chart I

Dengue Epidemic in Cuba, June 9 to October 10, 1981*

Week	Cases That Week	Average Per Day	Running Total
June 8-15	8 714	1 267	8 714**
June 16-22	25 733	3,676	34,447
June 23-29	40 434	5 776	78 770
June 30-July 6	65 861	4,847	144 340
July 7-13	51 146	7 306	195 676
July 14-20	15 452	9 1064	211 128
July 21-27	24 161	3 451	235 741
July 28-Aug. 3	23 955	3,422	259 206
August 4-10	18 314	2 619	287 617
August 11-17	11 757	1 680	301 474
August 18-24	5 961	709	310 068
August 25-31	2 356	336	312 516
September 1-7	741	106	313 457
September 8-14	202	29	313 756
September 15-21	24	3	313 781
September 22-30	48	4	313 829
October 1-10	12	1	313 845

* ... Cuban Ministry of Public Health.

** Due to reported figures do not include cases reported prior to June 9.

Chart II

Pan American Health Organization
Report of August 27, 1980

Country	Reported Cases of Dengue, 1981
Anguilla	1
Antigua	1
Barbados	1
Colombia	2,972
Cuba	337,160
Dominica	3
El Salvador	443
Grenada	2
Guadeloupe	10
Haiti	22
Honduras	466
Mexico	654
Montserrat	1
Puerto Rico	365
St. Lucia	1
Trinidad & Tobago	2
United States	2

Weather Modification?

Yet another peculiarity involves the unprecedented initial dispersal of Cuba during the weeks and spring preceding the epidemic. This led to an unusual accumulation of mosquito breeding areas, which unfortunately helped the spread of the dengue once infected mosquitoes landed. Statistics for the three provinces in which the epidemic began show that rainfall in March for example was double the average. [See Chart III.] Strange weather patterns existed in more than half the provinces of the island.

Chart III

Rainfall (mm.) in Cuba, March 1980*

Province	Actual	Average	Increase Over Average
Camaguey	86	47	+83%
La Habana	73	33	+121%
Cienfuegos	61	37	+72%

*From Cuban Ministry of Public Health

Whether the unusual precipitation was the result of artificial weather modification conducted with the intent of infected Aedes mosquitoes or merely a fortuitous coincidence cannot presently be the province of the actual case available at this time. It is clear though that the increase in precipitation made breeding areas for the Aedes mosquito more plentiful. It is also known that the U.S. has the technology to weather modification for many years. It is known that cloud seeding was used in the Vietnam War to advantage to enhance the effectiveness of bombing and the flooding of rice fields. It is also known that Cuba is in the vicinity of weather modification.

"During 1967 and 1970," according to Warren Hinckle and William Turner in "The Fish Is Red," "the USSR deployed intensive weather modification technology to ravage Cuba's sugar crop and wither the economy. Plowing into the China Lake Naval Weapons Center in the Calif[illegible] desert, where hi-tech weapons developers, mystics, the world's leading rain dancers and psychics [illegible] tons of seeding materials with symbols that precipitated torrential rains over sugarcane and rice fields and hit the cane fields and the dam[illegible] cannot take their threats in some cases."

If that kind of purposeful accuracy was possible, and Hinckle and Turner got their information from participants, then planning the dengue epidemic in retrospect would be a simple task.

Arboviral Research

Most important, perhaps, is U.S. involvement with arboviral transmission, with years of biological warfare research involving Aedes and other mosquitoes and dengue and other fevers. As has been documented in Seymour Hersh's "Chemical and Biological Warfare: America's Hidden Arsenal," the U.S. has been experimenting with dengue fever since at least 1956, primarily at Fort Detrick in Maryland and at Walter Reed Army Institute of Research in Washington. Public reports issued by the [illegible] Medicine, February 1963) showed a need for research into arboviruses as biological warfare. Of course, these early public reports are not proof that such research was already taking place. Also, there are reports that as early as 1972 U.S. researchers were working on genetic vaccines against type 2 dengue.

A review of publicly available summaries of research projects confirms the government's open sponsorship of extensive research into dengue fever and related diseases for many years. Dozens of these projects, costing millions of dollars, have been funded by the Department of Defense. The publications noted are, of course, deliberately "cooperative in the training process as a source for the production of general biological competence in these areas," as one such summary puts it. But the public summaries acknowledge that arboviruses may be used in biological warfare. One notes that research into the debilitating effects of dengue have "primary potential for protection against 'nation-debilitating' [illegible] in certain parts of the world," but also indicates they are directed "against which medical defenses will be required should they be used as biological agents." Other reports suggest that the U.S. maintains stocks of chemical and biological warfare [illegible] for defensive purposes—because others might use it against the U.S. Therein lies the difficulty in weighing the CBW issue. Research for "defensive" purposes and research for "offensive" purposes are indistinguishable.

The connections between the academic community and the government, especially the military, are pervasive. Nearly all the leading researchers have been associated intimately with military investigations into chemical and biological warfare.

One leading scientist in this field is Dr. Charles Calisher, an arbovirologist for the Pan American Health Organization, a division of the World Health Organization. Since 1971 Dr. Calisher has served at the Fort Collins [illegible] of the U.S. Centers for Disease Control in Georgia. Dr. Calisher has not been screened with extreme scrupulosity. Certain health officials [illegible] Arboviral abstracts from 1944 to 1977 [illegible] studies on dengue in Cuba, nevertheless, health officials were [illegible] and about all [illegible] because of the prevalence of mosquitoes. In 1972 a [illegible] health officials began a research study [illegible] including altered

since at PAHO meetings. At a 1976 meeting Calcher made many contacts, almost dropped in on the and expressed a strong desire to visit and study the advances achieved in Cuba. In 1975 he visited the island, according to Cuban sources. Dr. Calcher predicted at that time that Cuba might face a dengue epidemic within two years, because, he said, of their relations with African Times, in 1977, for the first time in 33 years, there was a dengue epidemic in Cuba.

When Cuban officials charged that the 1981 epidemic was a clandestine operation of the U.S., Dr. Calcher was one of the U.S. experts who publicly belittled the accusation, pointing out that there were many similarities in Cuba and surrounding its relations with nations of Africa and Southeast Asia. The "explanation" was given even though no tested above sources from dengue areas had been checked and even though the initial cases were acclaimed to foreign travel.

Another of the most active researchers today is Dr. William J. Scherer of Cornell University. According to an expert in "Who's Who" from 1965 to 1972 he directed the establishment and operation of the Armed Forces Epidemiology Board. Dr. Scherer has directed a number of projects, referred the Department of Defense/Army study

[illegible] vaccinations. That is, the boxes which were sent to the various health organizations and the [illegible] Dr. Scherer has been engaged since 1952, have proved the lack of success of various species of mosquitoes and, in addition, birds and bats.

Defense Department research is still going on. On February 17, 1982 the Under Secretary of Defense for Research and Engineering delivered to the Senate a required report on "research related to the chemical warfare and biological defense research programs during FY 1981." The term "biological defense" is known and even though there is virtually no difference between biological offense and biological defense research. This is in large part because a 1972 treaty to which the U.S. is a party outlaws biological warfare research, development, or stockpiling, except for defensive research. The report noted nearly $42 million was allocated for "risk assessment and evaluation of [agents] and their vectors that pose a BW threat." The studies included investigations into the "growth and survival of various organisms in mosquitoes," "new techniques" for detecting mosquitoes with hemorrhagic fevers, and other such "defensive" research.

Conclusions

That the dengue epidemic could have been a covert U.S. operation is clear. It is a plausible hypothesis, consistent with past actions. Moreover, there is ample evidence that the U.S. has been investigating the biological warfare possibilities of dengue fever for many years. And it is U.S. experimentation which has shown that Aedes aegypti mosquitoes infected with dengue could travel hundreds of miles, along the path of the prevailing winds, from the place of release to the place of landing. A boat off the coast of Florida or the right time with the right winds could sprinkle mosquitoes on Cuba with no fear of infecting the mainland. Of course, it is also possible that a ship or plane based at Guantanamo could have been used.

That the epidemic was an American covert action is less easily corroborated, but there are many indications that this is true and that the Cuban accusation is valid. The most significant fact is the simultaneous outbreak of the disease in three widely separated places. Were terrorist forces, as Castro has done, that these two cities could not similar significance or contact with foreign nations, and are partisans, as we can see, that the people's militias in Cuba from dengue infected areas during the several weeks preceding the outbreak were not infected, the only logical conclusion is the artificial introduction of the disease. Moreover, there were no epidemics in nearby countries.

In addition, this was the first case in the Caribbean of this serious, that an epidemic of this sort evolved hemorrhagic shock, the most dangerous form of dengue fever. Dengue fever, as a biological weapon, would undoubtedly be of the hemorrhagic kind.

And, finally, there is the unusual precipitation shortly before the outbreak of the epidemic. For such a operation to be successful, it would be necessary to create a very large mosquito population at the time of the introduction of the infected vectors, otherwise the rapid and devastating spread of the disease would not be guaranteed.

Perhaps some day the full truth will be known. But for those who have studied the recent history of the United States, the CIA and the Pentagon, it is known of what it is capable, for these also were the years of, especially in the Caribbean, terrorism-ridden 24-year campaign against Cuba. For these were in particular what we have to give the U.S. the benefit of the doubt. ●

Caught *in fraganti*. This is the moment in which the U.S. aircraft is caught spraying the Thrips palmi karay plague over the national territory, using an international air corridor.

Photo of the Thrips palmi under the microscope. This plague did not exist in Cuba until it was introduced by an American aircraft.

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"THE MISSION OF THE GROUP HEADED BY ME WAS TO OBTAIN CERTAIN GERMS AND INTRODUCE THEM IN CUBA."

Statement by terrorist Eduardo Arocena before de New York City Federal Court, p.2189, 1984., file 2 FBI NY185-1009.

But Arocena was not tried for this confession nor was any investigation opened by the U.S. authorities.

In 1981, an epidemic of hemorrhagic dengue broke out in Cuba that infested 344,203 persons and took the lives of 158, of which 101 were children. This and other aggressions described by the author with an abundance of documents have destroyed crops and caused the loss of tens of thousands of poultry, swine and cattle in our country.

Ariel Alonso Perez (Havana, 1949) studied aviation, mechanical engineering and law. He is a professor of History and Philosophy. For more than a decade he has researched into the biological aggressions against Cuba. He was awarded the Grand Prix and First Place by the Biological Chemistry Commission for his research into the *Hemorrhagic Dengue of 1981*. He also received a special mention for his research *Biological Aggressions Against Poultry Farming in Cuba* and an award for his essay *Biological Warfare Against Cuba*.

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